Pests

AND THEIR CONTROL

1947
JANUARY
VOL. 15, NO. 1

ORGAN OF THE PEST CONTROL INDUSTRY

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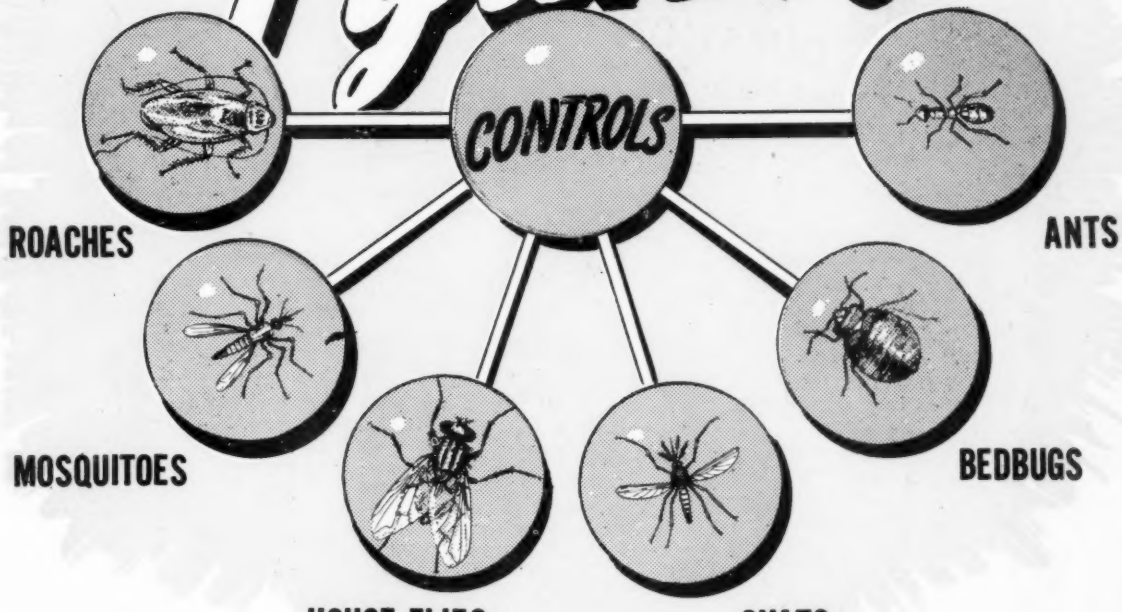

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A: One pound cans and in steel cylinders containing 10, 40, 50, 150, 175 or 350 pounds.

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(To be continued next month)

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Pests

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Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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EDITORIAL

Looking Ahead

WITH this issue, Pests completes fourteen years as a journal serving the Pest Control Industry. Pests as usual, faces 1947 with renewed hope and renewed vigor —with confidence in the future of the industry, confidence in the National Association and confidence in itself.

Pests is proud of its honorable history and of the part which it has played in the growth and development of our National Association. Credit is given to our leaders who have supported Pests and thereby have made it possible for it to play that important part. We hope it is a matter of interest to all to know that Pests has made great strides during the past year. Pests was founded to fill a real need for full, impartial knowledge about everything that pertains to the industry. Those who have read Pests during the past year will recognize that much information and many valuable articles have been published for their benefit and interest.

Pests has endeavored to serve the industry, and we hope to give more during 1947. While we shall strive to live up to this responsibility, no doubt some mistakes will be made, but they will be from the head and not of the heart. Pests has become a powerful medium to disseminate valuable and useful information to the industry, and we want our readers to know that every effort is being made to improve and enlarge Pests to this end.

Now let us take a view of the pest control industry itself. Another milestone in the industry, with vast potential significance for all PCO's was reached in our recent NPCA Convention held at New Orleans. PCO's who attended surely obtained a clearer understanding of policies, standards, chemicals, materials, techniques and methods of operation than ever before.

Perhaps two of the most important objectives for the industry are: to reach out for a keener perception of our professional problems, and to do business on an ever higher ethical and more sound basis. The pursuance of this course will eventually elevate our profession to a still higher plane.

With a new stage before us for 1947, PCO's should be encouraged to grasp the splendid opportunity which presents itself. Prof. J. J. Davis has recently said, "Many commercial pest control operators have exhibited morbid thought of the possible decline of pest control as a commercial service business, because of the new chemicals, controls, etc." But, instead, let PCO's realize the apocalyptic importance of having a greater technical knowledge in these new chemicals, materials and methods, and above all, render more efficient service to the public.

As George Hockenyos has well said, "The era of preventive pest control is just opening up and our place in it as professional pest control operators will be just what we made it." "And finally, What of the future?", says Professor Davis. "I know of no industry or profession that has a brighter outlook than that of the pest control industry. But this prediction or statement is prefaced with the condition—if the industry wakes up to the necessity of maintaining standards, provides good service, and maintains ethical operations."

Let us look forward to 1947 becoming our most profitable year because of better work done and higher ethics followed.

Onward March of PCO Conferences

In the fourteen years since its formation, the National Pest Control Association has taken more and more responsibility as a "clearing house" for the pest control industry, and has also rendered individual assistance to PCO's. The industry has much to be thankful for, enjoying as it does to a great extent unique voluntary commendation from government, state and city officials, because of the farsightedness of the National Association in holding PCO Conferences that PCO's may have the opportunity to study and learn more of their profession.

PCO's today face a complexity of problems never before encountered. They need to know the answer to many questions of vital importance. Never have PCO's as an industry faced such challenges and opportunities as the immediate future will bring. The resourcefulness and ingenuity of every PCO will be taxed to the limit in selling his service to the public. Never before have the PCO's faced the extreme necessity of having an increased knowledge of their profession. Today as never before PCO's face the need of keeping abreast of the rapid development of new trends, new plans, new policies, new methods, new materials and techniques of operation.

It is therefore of paramount importance that every PCO plan to attend at least one of the coming conferences. As the public is becoming more and more educated to the importance of our industry, it behooves PCO's to sense the utmost importance of attending these conferences.

Subjects and discussions of wide significance and vital concern to every PCO are scheduled at these conferences. Emphasis will be placed on plans, methods and ideas that will enable PCO's to mobilize their business against the challenge and opportunities of tomorrow.

You owe it to yourself and to your business to attend these outstanding conferences; so make your plans to attend one or more of the following:

Seventh Annual Southern PCO Conference. Louisiana State University, Baton Rouge, La., January 30, 31, February 1, 1947.

Seventh Annual Eastern PCO Conference. Massachusetts State College, Amherst, Mass., February 3-4-5, 1947.

First Annual Pennsylvania State PCO Conference, Penn. State College, State College, Pennsylvania, February 3-4-5, 1947.

California PCO Educational Conference, College of Agriculture, University of California, Berkeley, Calif., February 10th to 12th, 1947.

Fifth Annual Canadian PCO Conference. University of Montreal, Montreal, Quebec, Canada, February 17-18-19, 1947.

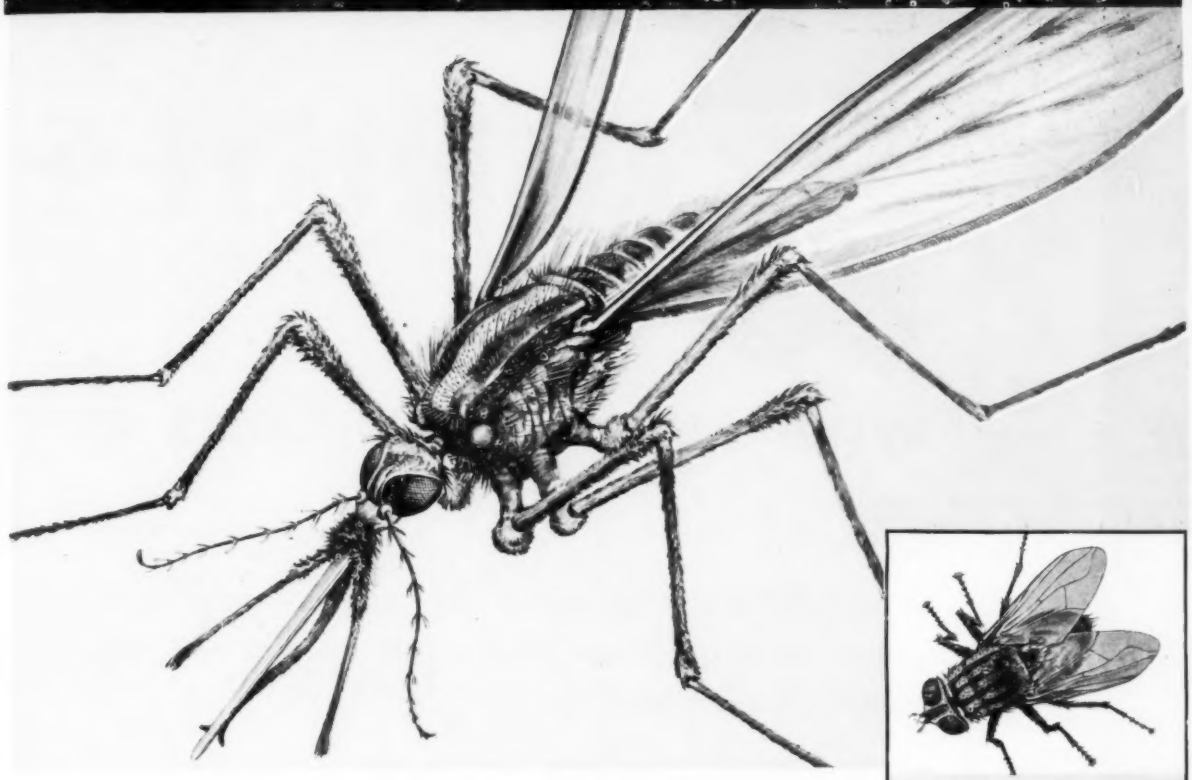
Eleventh Annual Purdue PCO Conference. Purdue University, Lafayette, Ind., April 7-11, 1947.

Western PCO Annual Conference, February 13, 14, 15, 1947. Mission Inn, Riverside, California.

For a time it looked as though the Purdue Conference could not be arranged because of overcrowded conditions at the University, and an overworked teaching staff. However, through the untiring efforts of Professor J. J. Davis obstacles have been overcome, and the cycle of Purdue conferences will not be broken to the disappointment of those who have been looking forward to this event each year. We are grateful to Professor Davis for his deep interest in the industry, evidenced once more by his efforts in behalf of this year's conference.

Now, PCO's, before you forget, check your dates and plan and arrange your work to attend one or more of the above-listed conferences. You cannot afford to stay away.

FOUR PESTS THAT CAUSE GREAT DAMAGE TO HEALTH AND CROPS



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Experiments with DDT for the control of the codling moth and the Colorado potato beetle, costly horticultural pests, already show great promise. However, tests in the agricultural field, to be conclusive, generally require several growing seasons. As a result, only tentative formulation recommendations have been made pending further research.

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Test results, as depicted at right, show conclusively that economical proportions of Thanite and DDT give a THREE-MINUTE KNOCKDOWN of better than 92 out of every 100 flies sprayed!

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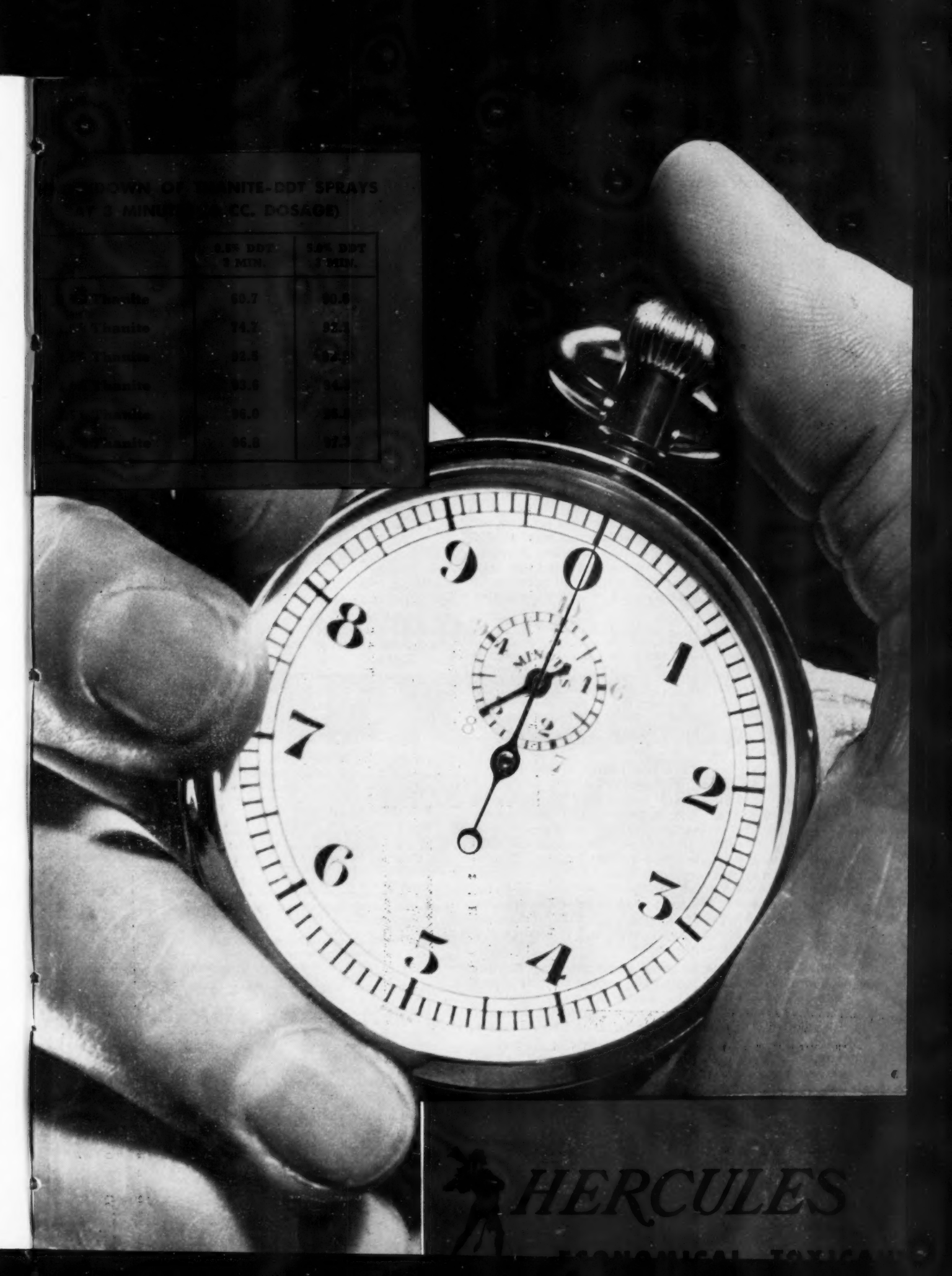
HERCULES

Tooling Up for '47

By WALTER S. McCLOUD*, *Past President, NPCA*

The war has borne its influence on our business as well as on everyone else's, little as the layman knows this. He, our customer, has awakened too soon and abruptly to a scientific discovery brought about by the war . . . DDT. He has hastily come to the conclusion that DDT, like DUZ, does everything. Consequently, when he thinks about exterminating as a profession, he is inclined to believe that the war, if anything, has made our business easier for us. Has it? You answer.

While this problem of re-educating the public on the uses and misuses of DDT is an outstanding one, it is decidedly not our only one. Considering it first, however, we can all agree with what Dr. F. C. Bishopp recently said of new insecticides in a magazine article:

"No insecticide yet discovered is highly effective in killing all kinds of insects. This specifically makes it necessary to determine, first, the efficacy of the material and of its components against a wide range of insects; second, what effect various accessory materials and other modifications of formulations have on its toxicity; and third, what combinations with other insecticides may be made to increase toxicity to given insect species or to reach other pests not effectively controlled by the material in question. The initial testing in the first category takes much time and in the case of DDT, for example, the second phase is not yet complete and the third has just begun."

We in the business have had plenty of opportunity to test various formulae. We know what will work and what will not work in specific cases. Now let us try to prove to the public that there is more to DDT than can be read on a label. The proper re-education in personal contact and in advertising will then put an end to the calls that you as well as I have had to this effect: "Please bring along some DDT, we have mice." Goodness knows what family ills the layman thinks can be cured by DDT, as the layman sees it. We still have to take the product apart for him and break it down into its true form — an agent that cannot be effectively, even safely, used except by experts.

Experts, true experts, never stop tooling up for improvements in their business. The better way of doing our job in 1947 is going to depend a lot on improved insecticides and intelligent diagnosis of exactly what to use where. It is also going to depend a lot on finding better specific tools with which to make applications. Someday, a smart manufacturer of insect sprayers is going to produce a sprayer just for our man, the "inside job" man. My order is ready and waiting for that manufacturer to come across.

In our business, everything else considered, the man is the tool that counts above all. If we can get the right men — with aptitude, intelligence and conscience — we can wait a few more months for that perfect sprayer.

Andrew Carnegie, a canny Scotsman if there ever was one, when asked what he could do if he lost all of his millions, said, "Just give me my men and I will get it all back."

In this connection, I should like to remind you of the "biological profiles" used by the Army and Navy to find the proper spots in service for men by way of aptitude tests. Designed and administered by experts in psychology, these "biological profiles" put former clerks into baker's schools, salesmen into infantry, truck drivers into office jobs — and whatnot. Test sheets for making "biological profiles" are now available to the public.

A young man, particularly the young man who has come out of this war, does not always know himself and what he is fitted for. I should like to suggest that more of us make use of scientific material that is available to us for finding the right men for the jobs which our profession has open — the one or two or ten jobs that you need to have filled right now.

There is a worse way to spend money (and I found it trying out dozens of misfits) than to put it into the kind of personality finder that I have been talking about. It might well be part of your tooling up for 1947. It is already part of mine. (Not an advertisement. Just a McCloud conviction.)

*W. B. McCloud & Co., Chicago, Ill.

Man Must Battle Pests

Recent developments — particularly in connection with DDT — have made insect pest control more effective and practical. But other developments have favored the pests and intensified the problem. In making these points at a meeting of the National Pest Control Association, E. F. Knipling of the U. S. Department of Agriculture, (whose paper appears elsewhere in this issue) emphasized four important reasons why there can be no "resting on our laurels" by either the professional entomologists and chemists or the commercial firms that put the results of entomological investigations into practical use.

According to Knipling, who is in charge of the entomological division dealing with insects affecting man and animals, these four reasons are:

1. Conditions are more favorable for an increase in numbers of many pests. In our homes there are a greater variety and new types of food; and more dresses, coats, and other apparel in the closets. With controlled temperatures the year round these conditions favor the increase of pests in homes and also in food plants, warehouses, and retail stores.
2. Increase in speed and amount of transportation and increased shipments of foods and supplies, together with greater concentrations of populations and growth of metropolitan areas, favor the spread and survival of pests.
3. There is reason to believe that pests can adapt themselves to new environments and increase in numbers or develop a tolerance to control measures.
4. The persons seeking pest control will continually demand higher standards. Twenty-five years ago many housewives may have tolerated a number of flies in the home or in food stores. In the last decade this tolerance has gradually been reduced, and today they are concerned over even a few flies. Also, health regulations and sanitary requirements are stricter.

Index

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The Murine Typhus Fever Problem in the United States *

By JUSTIN M. ANDREWS, *Senior Scientist (R) and* VERNON B. LINK, *Surgeon, United States Public Health Service*

EDITOR'S NOTE: *This paper was given by Mr. Andrews at the 14th Annual Convention of The National Pest Control Association, New Orleans, La., October 28, 1946.*

MURINE typhus fever belongs to a group of diseases of ancient and world-wide significance. According to Wolbach (1), their importance economically and as a menace to life is probably exceeded only by malaria. Its most notorious member, European typhus, has been for centuries one of the great epidemic scourges of the world, a prime factor in determining the outcome of wars and the course of history. All members of the group are caused by microscopic germs which can subsist in nature only within the living cells of infected animals, including man. They are known as "rickettsiae," a tribute to Howard Taylor Ricketts, a scientist whose work contributed fundamentally to our understanding of these organisms and the diseases which they cause. He died from typhus in Mexico in 1910.

The rickettsial diseases of man are characterized by fever, skin discolorations caused by damage of underlying blood vessels and by certain central nervous system changes. From the standpoint of transmission, there are four sub-groups, typified as follows:

1) **louse**-borne: epidemic or European typhus fever

2) **flea**-borne: endemic or murine typhus fever

3) **tick**-borne: Rocky Mountain spotted fever

4) **mite**-borne: tsutsugamushi or scrub typhus fever

Variants of the four examples given are found in different parts of the world.

In the United States, three of these types have occured. During the 19th century, several outbreaks of typhus fever were noted in cities along the Atlantic seaboard and the Gulf of Mexico. These were associated with European immigrants and were, presumably, of the epidemic variety transmitted by body lice. In 1910, Dr. Nathan Brill (2), a New York physician, described a sickness resembling European typhus but which was less severe and failed to exhibit its distinctive winter prevalence. It came to be known as "Brill's disease" and later proved to be a member of the rickettsial group. From careful study of a number of these cases in New York and Boston, the late Dr. Hans Zinsser (3), author of "Rats, Lice and History", concluded in 1934 that these were relapses of old louse-borne infections acquired originally in Europe. Until that time, **all** cases of typhus in this country were commonly referred to as "Brill's disease". By some, the term is still used loosely and inaccurately to include southern murine typhus. The incidence of Brill's disease—**not** of murine typhus—has decreased steadily, and this illness is not now regarded as a public health problem.

The second of the rickettsial diseases in the United States is Rocky Mountain spotted fever. Since pioneer days, this devastating infection has been known and dreaded in the Northwest. Before the days of protective vaccination, it killed from 85 to 90 per cent of the persons it attacked. It is carried to man and numerous other hosts by the wood tick which has the unique and formidable ability of passing rickettsial organisms from one generation of its kind to the next. Thus, there is maintained a continuing source of infection difficult to extinguish. That it occurs in the Eastern as well as the Western States was not known until 1931, when Drs. Rumreich, Dyer and Badger (4) of the U. S. Public Health Service distinguished in the Middle and South Atlantic States a similar disease more severe than endemic typhus in the Southeast, but less deadly than western Rocky Mountain spotted fever. During the same year, Dyer (5) and his collaborators were able to transmit it experimentally with the local dog tick and identified the infection as the "eastern type" of Rocky Mountain spotted fever. Subsequently, it was found in most of the Southcentral, Southeastern and Middle Atlantic States.

The third member of the rickettsial group in the United States, and the one with which we are primarily concerned in this discussion, is murine typhus fever. In 1913, Dr. James Paullin (6) reported typhus fever cases in Atlanta, Georgia. Shortly thereafter, similar observations were made in North Carolina, Texas and Alabama. In 1926, Dr. Kenneth Maxcy (7), of the U. S. Public Health Service, pointed out that these southeastern typhus cases were twice as frequent in males as in females, less prevalent in Negroes than Caucasians, that they occurred about as often in the well-to-do as in the poorer classes and that most of them appeared in the summer and fall months. These facts did not accord with louse transmission, and he suggested that some other blood-sucking creature might be the vector and that the disease might be reservoired in domestic rodents as he noted that many of his cases were persons handling foodstuffs. Following this suggestion, Dyer (8) and his associates were able to produce experimental typhus in 1931 with fleas removed from rats trapped in a typhus-ridden section of Baltimore, Maryland. Since that time, it has been shown that the infection is **primarily** one of rats and mice, that it is spread from rodent to rodent by their fleas, lice or possibly mites and, occasionally, to man from rats or mice presumably by their fleas. Thus a new cycle, differing from the man-louse-man transmission of European typhus was established. Certain differences were demonstrated in the behavior and characteristics of the rickettsiae causing the louse-borne typhus of Europe and the cases from the Southeastern United States. In the course of time, the latter disease came to be called endemic or murine typhus. It is now known to be distributed widely all over the world.

This disease is an acute, febrile illness which manifests itself some six to twenty-one days after infective organisms enter the body. It usually begins suddenly with chills, feverishness, general discomfort, body aching, and prostration. Ordinarily, the patient is sick enough to require medical attention within two or three days.

His temperature rises gradually for the first five to eight days, dropping every 24 hours from one to three de-

*From The Communicable Disease Center, U.S. Public Health Service, Atlanta, Ga.

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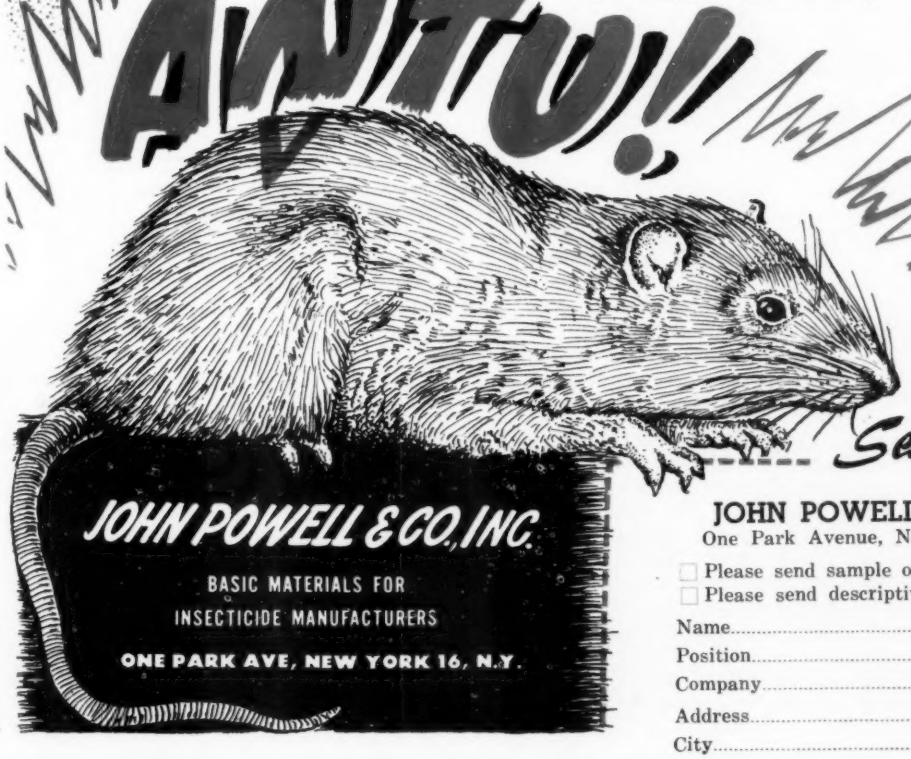

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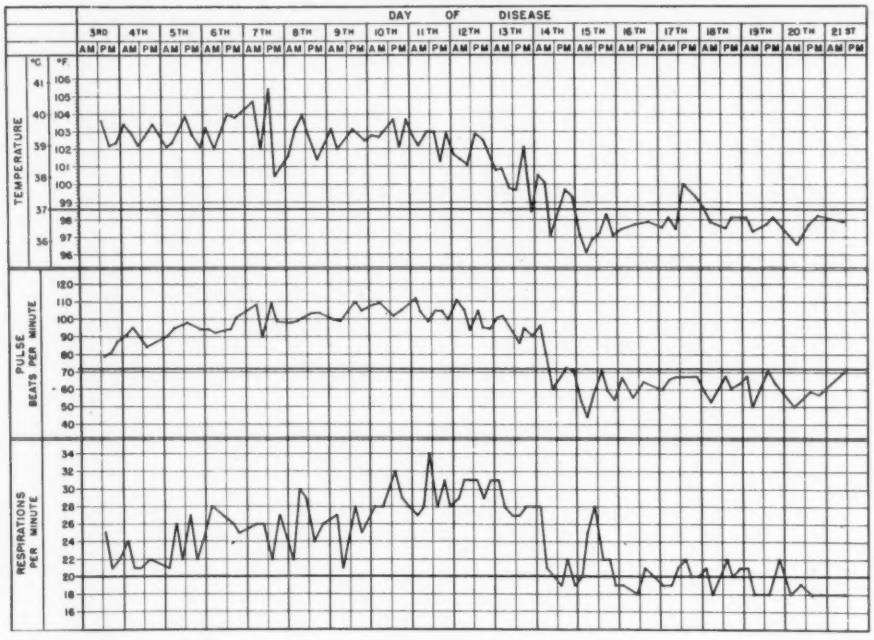
grees, then continuing upward progressively to a maximum of 103° to 105° (Figure 1). From that point, it declines spontaneously, but with the same daily irregularities until it becomes normal on or about the fourteenth day.

Central nervous symptoms are characteristic of typhus. Dullness, apathy, nervousness, irritability, deliriousness and actual coma are not infrequently present. The name "typhus", derived from the Greek word meaning stupor, refers to the mental impairments associated with the infection. These are not as common nor as serious in murine as in epidemic typhus.

TEMPERATURE, PULSE AND RESPIRATION IN A TYPHUS FEVER PATIENT
(MAXCY 1926)


DAY OF DISEASE
3RD 4TH 5TH 6TH 7TH 8TH 9TH 10TH 11TH 12TH 13TH 14TH 15TH 16TH 17TH 18TH 19TH 20TH 21 ST
AM PM
TEMPERATURE
°C °F
PULSE BEATS PER MINUTE
RESPIRATIONS PER MINUTE

(Figure 1)

Severe headache is an early symptom and the usual story is that it is the worst the patient has ever experienced. Weakness and prostration are also pronounced and confine the patient to bed for a week or more after the acute phases of the illness are over. Loss of appetite is common and nausea and vomiting may be present especially during the first few days. Cough is a frequent symptom and actual pneumonia is seen in about two per cent of all cases.

The rash usually appears on about the fifth day and develops rapidly. It starts as small, dusky-pink, slightly elevated spots first seen on the abdomen and the inner surfaces of the arms. Within 24 hours, it has spread to the rest of the trunk, the arms, and the thighs. It is rarely seen on the face, scalp, palms of the hands or soles of the feet. As the eruption becomes more profuse, the color may change from dull red to a darker hue with a purplish tinge. It commonly lasts 48 to 72 hours; in rare instances, it may persist longer, the discolored spots coalescing into small areas of hemorrhage under the skin. These develop brownish pigmentation and disappear within a week or more.

In certain instances, the disease resembles and must be differentiated from other acute fevers which may occur in the same area. These include typhoid fever, malaria, relapsing fever, Rocky Mountain spotted fever, and encephalitis. Clinical criteria and laboratory methods are available for either identifying or eliminating them from consideration and for confirming the clinical suspicion of endemic typhus. The Weil-Felix reaction is a blood test used widely in identifying the group of rickettsial diseases. Differences in the reactions of inoculated guinea pigs and rats help to differentiate murine from louse-borne typhus. Another diagnostic aid, sharply specific for murine typhus in man or rat, is the complement fixation test. This is similar to certain of the blood tests for syphilis. Typhus-infected individuals are known to remain positive by this test for at least nine years in the case of man and for at least a year in rats.

Until recently, the treatment of this disease has been non-specific and aimed entirely at the relief of symptoms. The use of para-minobenzoic acid during the mid-febrile period of murine typhus has been reported to shorten the duration of fever by an average of nearly three days (9). Further study is indicated, especially of its effect when the drug is administered earlier in the course of the disease.

The expectation of recovery is usually very good in murine typhus fever. The average number of deaths per 100 cases is from two to five for all ages but is much higher for persons past middle age, as shown in Table I.

The most serious aspect of this disease is the long period of physical non-effectiveness associated with it. While the acute phase is generally concluded within twelve to fifteen days, the patient is so depleted that he is rarely able to leave his bed for another week. It is a month or two more before he can return to work and even then he is apt to be nervous and depressed for some time. All told, the non-productiveness of its victims usually extends over two or three months. This loss of income must be added to the costs of hospitalization, medical care and nursing in evaluating the economic importance of the disease.

TABLE I

Case Fatality Rate of 1029 Cases of Murine Typhus Fever in Alabama, 1932 to 1933 (10)

AGE	CASES	DEATHS	DEATHS PER 100 CASES
0-14	150	3	2.0
15-44	605	13	2.1
45-64	231	16	6.9
65 & Over	43	14	32.6
All ages	1029	46	4.5

Information about the prevalence of typhus is based upon the reports of practicing physicians. While these data have improved materially in accuracy and coverage during recent years, it is probable that many cases are still being missed or unreported, especially in Negroes. Since endemic typhus was first noted in this country, there has been a consistent upward trend in the annual totals of cases reported and in the numbers of States reporting from year to year, as shown in Figure 2.

For the last 13 years, 95 per cent or

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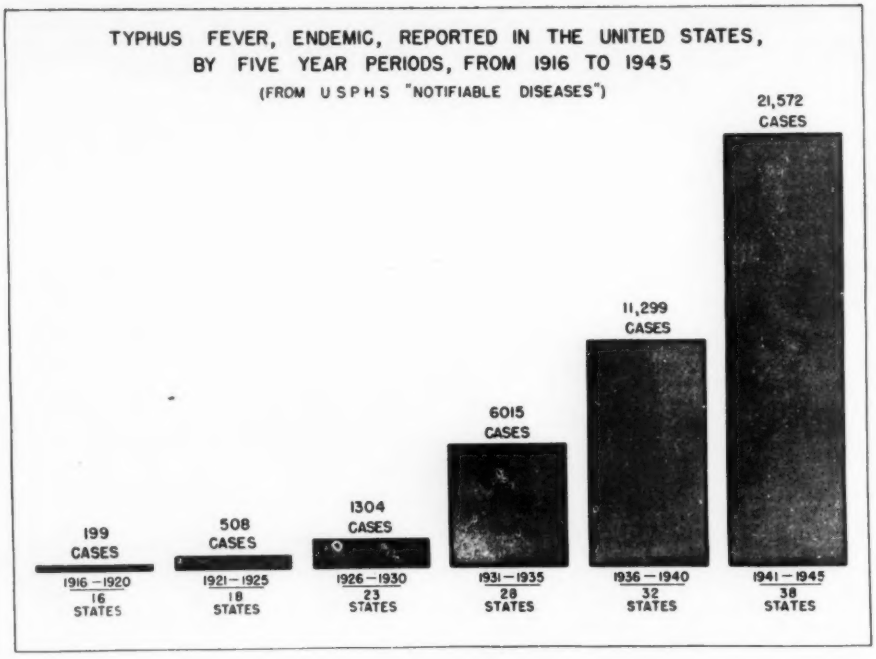

(Figure 2)

TABLE II

Reported Cases of Murine Typhus Fever in Nine States☆ from 1916 to 1945
(From USPHS "Notifiable Diseases")

Year	Texas	Georgia	Alabama	Louisiana	Florida	Mississippi	South Carolina**	North Carolina	Tennessee	Total
1916	0	0	0	0	0	0	0	0	0	0
1917	38	0	0	0	0	3	0	0	0	41
1918	11	0	0	0	1	0	0	0	0	12
1919	0	0	0	0	1	0	0	0	0	1
1920	7	3	0	0	1	0	0	2	0	13
1921	14	2	0	0	13	0	0	0	0	29
1922	4	15	2	0	0	0	0	0	0	21
1923	2	17	16	0	0	0	0	0	0	35
1924	69	0	0	0	0	0	0	0	0	69
1925	40	33	53	0	2	0	0	0	0	128
1926	15	50	48	0	16	0	0	0	1	130
1927	14	57	69	0	45	0	3	0	0	188
1928	5	48	59	0	49	0	1	0	2	164
1929	8	57	72	1	48	0	5	3	2	196
1930	13	238	67	0	39	0	22	16	0	395
1931	43	127	80	1	28	0	13	6	1	299
1932	227	308	237	17	42	0	24	24	2	881
1933	398	625	823	11	54	1	54	46	1	2013
1934	496	414	287	18	35	0	38	23	0	1311
1935	276	485	294	20	27	5	57	51	8	1223
1936	327	815	369	12	55	6	57	33	6	1680
1937	453	1046	480	23	121	15	101	70	22	2331
1938	497	956	353	27	116	25	146	89	24	2233
1939	538	1129	472	117	153	49	232	122	100	2912
1940	410	584	289	118	114	51	132	65	36	1799
1941	733	946	299	200	196	66	105	78	47	2670
1942	1204	1154	380	165	313	58	192	100	59	3625
1943	1452	1256	629	232	314	133	193	162	52	4423
1944	1740	1182	892	283	484	178	178	236	103	5276
1945	1833	1110	601	417	380	235	216	160	75	5027

☆Ala., Fla., Ga., La., Miss., N. C., S. C., Tenn., Texas
**South Carolina reported 1 case in 1914.

more of all the typhus cases in the entire country have been returned from nine States — Georgia, Texas, Alabama, Florida, South Carolina, Louisiana, North Carolina, Mississippi and Tennessee. Their annual totals, separate and combined, are shown in Table II. The combined progressive rise is interrupted from 1933 to 1937 and from 1938 to 1940. The explanation of these temporary declines is not known. Possibly they were due to unusually severe winters or to nothing more than the unaccountable vagaries of case reporting. At any rate they now appear insignificant in light of the continued rise and serve to caution against the acceptance of overhasty contentions regarding success in typhus control based on two or three years' favorable reports. Thus the 1945 cases are about 250 less than for 1944; from all present indications, the total for 1946 will be even smaller. Nevertheless, it would be imprudent at this point to assume that these two year's departures from the previous trend are really significant.

On the other hand, the extraordinary increase from 300 cases in 1931 to 5000 in 1944 contains enough elements of reality to cause profound anxiety among public health officials. That this is due to a variety of factors seems evident. Heightened awareness of the disease, improved diagnostic facilities and more adequate case reporting on the part of attending physicians accounts for much of the increment. This must have been true well into the last decade. However, there is little reason to believe that recognition and reporting of cases improved greatly during the war years with only a fraction of the medical profession left to cope with the medical problems of the entire civil population. Nevertheless, as shown in Table III and Figure 3, the number of reported murine typhus cases virtually doubled within the last five years and the number of counties from which they came was larger by 30 per cent. These data are strong evidence that the prevalence of murine typhus has actually increased per unit area and that the disease is steadily invading new sections of the States (see Figure 3) in which it is endemic. This has occurred in cities, towns and rural areas. The increase is due, presumably, to the advancing infiltration of the brown rat from port cities. Both Maxcy (11) and Meleny (12) have called attention to the possibilities of rail and trucking traffic as means of transporting rats. To these must be added the similar potentialities of air freight service. All of these common carriers cross State boundaries and, in the course of time, may serve to extend the area of this country known to be endemic for murine typhus fever. Thus the problem has Federal as well as State aspects. These circumstances justify the use of energetic measures not only in the control but in the prevention of the disease.

Within these nine States, as shown in Figure 4, typhus presents a problem of varying importance. Dr. C. R. Eskey* of the U. S. Public Health Service has demonstrated a direct relationship between the prevalence of murine typhus and average monthly temperatures. This manifests itself geographically in a heavier concentra-

*Unpublished data.

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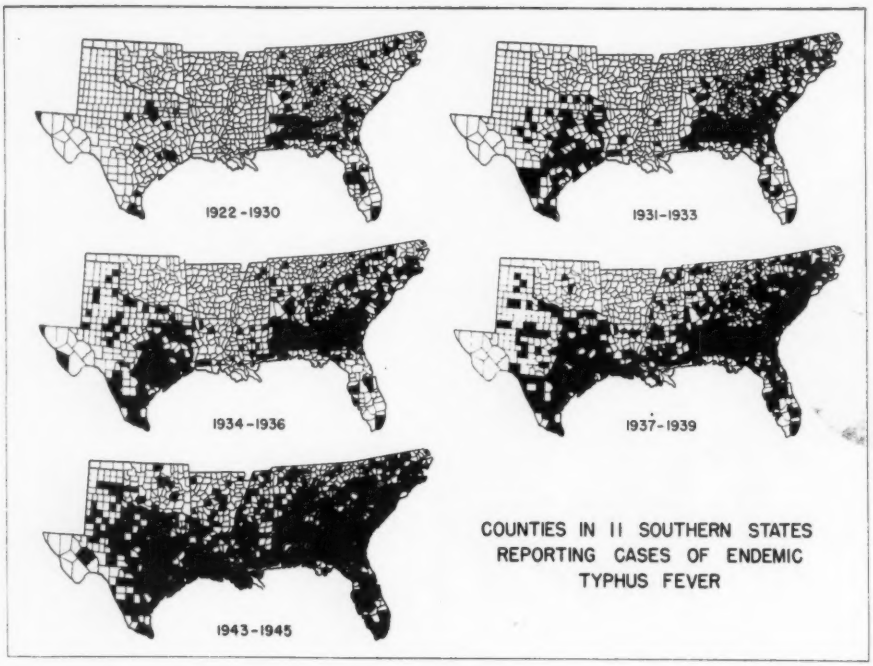


Figure 3 — All maps save for 1943-45 from Meleney 1941; map 1943-45 original.

TABLE III

Number of Murine Typhus Cases and of Counties in Nine States* from Which They Were Reported, by Years for Period 1941 to 1945
(From the USPHS Division of Public Health Methods)

YEAR	CASES	NUMBER OF COUNTIES REPORTING CASES EACH YEAR	CUMULATIVE TOTAL
1941	2651	380	380
1942	3585	408	501
1943	4384	436	581
1944	5242	468	640
1945	5029	494	692

*Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas.

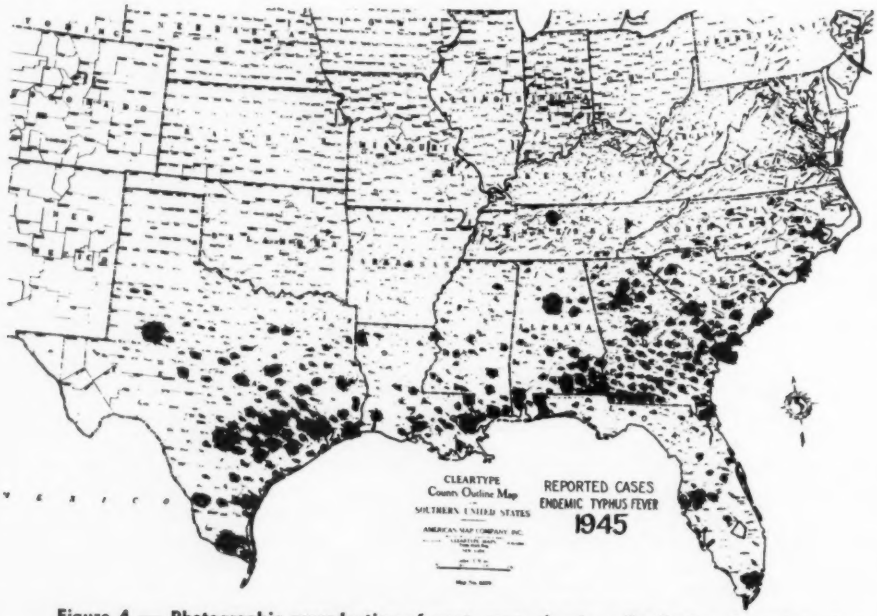


Figure 4 — Photographic reproduction of spot map showing distribution intensity of reported cases of endemic typhus for 1945 (Eskey).

tion of cases in the more southern and lower coastal plain sections of these States. It is shown especially well in Georgia and Alabama.

Sporadic cases of limited foci have been reported in Arkansas, Kansas, Virginia and California. Investigations are under way to determine the actual health hazard in these and other States bordering on the area now considered endemic.

Murine typhus fever is predominantly, though not exclusively, a summer and fall disease, as indicated in Table IV. Unlike European typhus, which occurs most frequently during the winter months when lice are more prevalent and the opportunities for their transfer from one person to another are greater, the murine type occurs during the warmer months when rat fleas are more numerous.

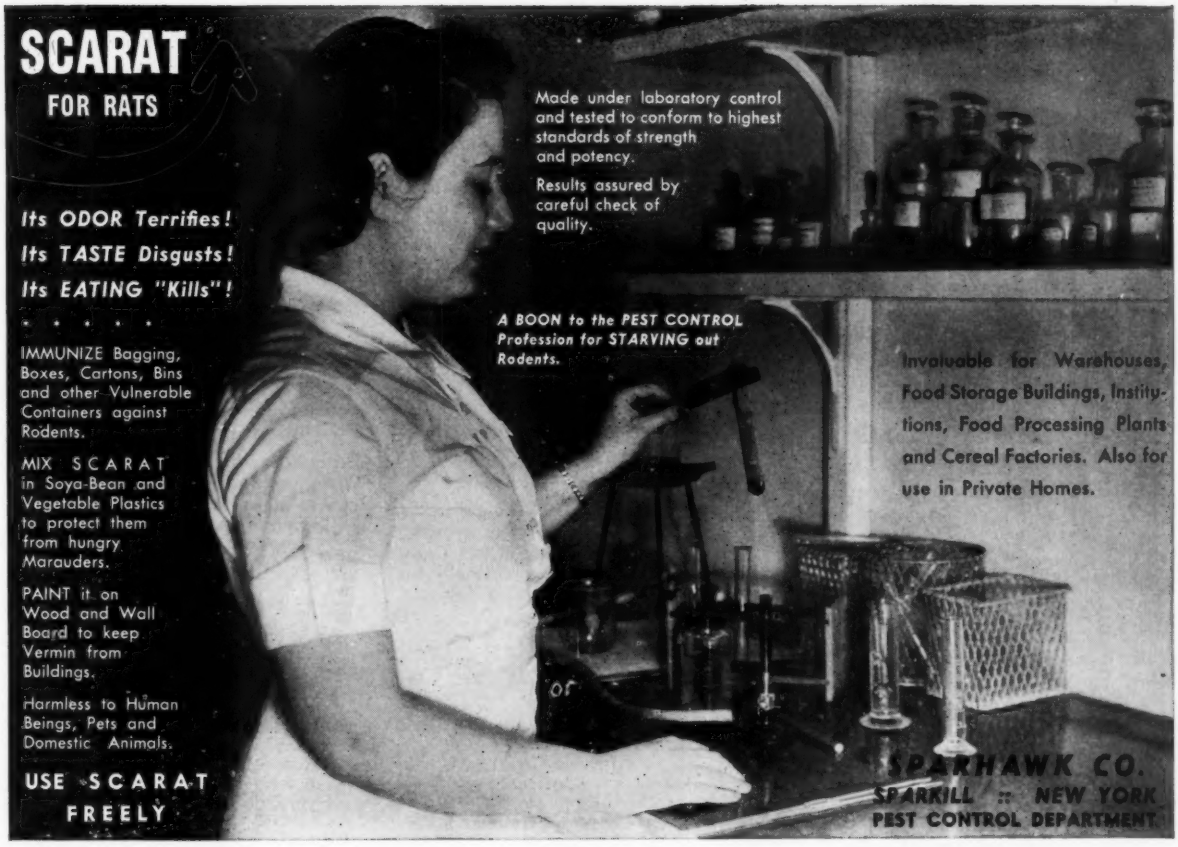
The exact means by which infective organisms travel from rat to man have not been determined conclusively. Experimental and epidemiologic evidence associates the tropical rat flea more than any other medium with the transmission of murine typhus to man. It must be emphasized, however, that rickettsiae have been found in the excrement of rat fleas (13) and in the urine of rats (14). Thus the possibilities of transfer to man by inhalation of dried flea feces in dust, or by the consumption of food or drink contaminated by flea feces or rat urine must be considered as well.

TABLE IV

Seasonal Distribution of Murine Typhus Cases in Nine States for the Five-Year period — 1941 to 1945
(From USPHS Division of Public Health Methods)

Month	Average Number of Cases Per Month 1941-1945
January	230
February	147
March	138
April	127
May	198
June	291
July	480
August	661
September	610
October	494
November	433
December	369

Murine typhus may occur in any age group, as shown in Table V, but is more frequent in adults than children. This is due, presumably, to the greater exposure of older persons to rats and fleas in commercial food-handling establishments. Probably for the same reason, the disease is more common in males (63 per cent) than in females (37 per cent).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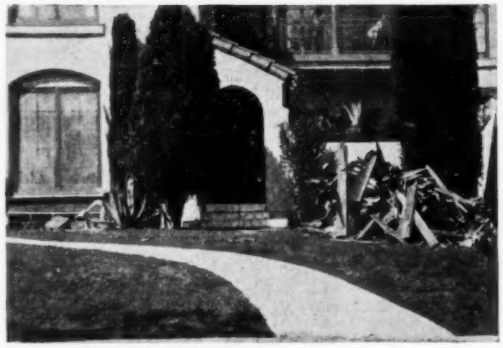

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TABLE V

Age Specific Attack Rates per 100,000 Population of 894 Typhus Cases in Alabama, 1932 to 1933 (10)

Age	Population	Cases	Age Specific Attack Rate Per 100,000 Population
0-4	313,882	14	4.5
5-9	331,713	37	11.2
10-14	303,440	78	25.7
15-19	294,168	94	32.0
20-24	259,361	77	29.7
25-34	373,787	177	47.4
35-44	294,862	179	60.7
45-54	244,862	132	53.9
55-64	129,664	68	52.4
65-74	68,430	33	48.2
75-	30,810	5	16.2
TOTAL	2,646,248	894	33.8

Of the 1029 cases occurring in Alabama in 1932 and 1933 (10), from which the above age and sex distribution are taken, only 77 (7 per cent) were among Negroes. This may be due to the fact that Negroes receive less medical care and cases do not get reported as frequently as among their white neighbors. Furthermore, the rash of typhus is more difficult to see on a dark skin and the diagnosis may thus be missed even when the colored cases are attended by physicians. As far as is known, no racial immunity exists.

In summary, it may be pointed out that:

1. Murine typhus fever is an acute infectious disease caused by rickettsial organisms transmitted to man from rodents probably by their fleas.

2. Even though its mortality rate is low, murine typhus is —

   a. A medical problem because of the amount of severe sickness it causes and the present lack of chemotherapeutic agents to ameliorate or reduce the course of the infection.

   b. An economic problem because of income loss during the protracted period of sickness and recovery and the costs of medical care.

   c. A public health problem of current importance because it is steadily increasing and extending its endemicity, and because the disease cannot be controlled or prevented feasibly and effectively except by community effort.

   d. A Federal as well as a State public health concern because the disease extends across State boundaries, involves common interstate carriers and its control and prevention require resources for investigation, technologic development and demonstration not now available to States.

3. The disease now appears to be fairly well confined within the borders of nine southern States though its prevalence within them has increased in recent years and has extended into counties where it was not previously known to occur.

4. Murine typhus fever occurs more frequently in the summer and fall than in the winter due to its association with rat-infested, food-handling establishments, it is more prevalent in adults than children, in males than females. Negro cases are probably not accurately diagnosed or reported. It should be emphasized, however, that the disease may attack anyone, regardless of age, sex or color.

5. Murine typhus fever is preventable. Because it is a medical, economic, and public health problem, all available measures, emergency or otherwise, should be energetically employed to control and prevent the disease by eradicating rodents and their ectoparasites and by otherwise reducing their contact with man where murine typhus is known or expected to be endemic.

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Government Scientists Now Know the Poison, 1080, Tastes Salty

The Potent Chemical Was Considered Tasteless Until a Fish and Wild Life Research Division Worker Tried It and Lived to Report

By **ARTHUR EDSON**

Washington, (AP) — The government came up today with a hero—a fellow who has learned what the potent poison 1080 tastes like.

Sort of salty, our hero says.

Now a fellow who will taste 1080 will skip rope with a live electric wire, play pat-a-cake with a man-gnawing tiger, and use a strychnine solution as a mouthwash.

Use Is Restricted

Why, 1080 is so deadly your fraidy-cat government won't sell is over any old counter. No, it slips it from underneath, and only to cities and states planning rodent control drives directed by experts. It got its name because the first 1,079 attempts to concoct a super poison were failures.

Once discovered, this white poison was considered tasteless for a long time.

Probably this was because nobody—except some assorted rats, cats, squirrels, rabbits and prairie dogs—ever tasted any.

Unfortunately, they were all too dead to be interviewed.

But today a fish and wild life leaflet floated in that says flatly that 1080 tastes salty.

"How do the F. and W. people know?"

"That's easy," Dr. Arnold L. Nelson, assistant chief of the wildlife research division, told a reporter, "Somebody tasted it."

"And who is this taste bud hero?"

"Oh, I don't know," replied Nelson, "But somebody did. Probably it was somebody in our Denver laboratory."

Research Termed Simple

Nelson said poison-tasting is simple. A scientist knows the poison's strengths. So he doesn't take enough to kill. Then he tastes, but doesn't swallow.

"Not much to it, really."

Would Dr. Nelson duplicate the experiment performed by our unidentified hero?

"Who, me?" asked Dr. Nelson. "Great heavens, no!"

And he turned as pale as 1080.

The Program of Murine Typhus Fever Control [1/]

By S. A. San. Engrs. JOHN S. WILEY *and* RICHARD J. HAMMERSTROM, *U. S. Public Health Service, Communicable Disease Center, Atlanta, Ga.*

SINCE about 1900 the Public Health Service has been actively engaged in rat control procedures to prevent the introduction and interstate spread of plague in the United States. Although the areas of plague infestation in rodents do not now overlap the endemic typhus area, during World War I plague appeared in several Gulf Coast cities in which murine typhus fever has since become a problem.

About 12 years ago, the Public Health Service began to assist State health departments in rodent control procedures directed against murine typhus fever. In 1939 the Service assisted in the control of an outbreak of typhus fever in Nashville, Tennessee. In 1941 the activities of the District No. 4 office in New Orleans were expanded to include assistance in the establishment of several experimental typhus control projects in Georgia. This work resulted in the development of new basic principles of ratproofing technique and created greater interest in typhus control throughout the South.

In May 1942, a new Public Health Service station, the Typhus Control Unit, was established in Atlanta, primarily as a field demonstration unit for ratproofing work. From this time until July 1, 1945, the Typhus Control Unit developed new methods of ratproofing and rat elimination. Personnel of that office participated in 61 ratproofing programs in 11 States and in Puerto Rico. In 1944 and 1945 experiments were made which demonstrated that DDT dust, applied to rat runs, will control rat fleas.

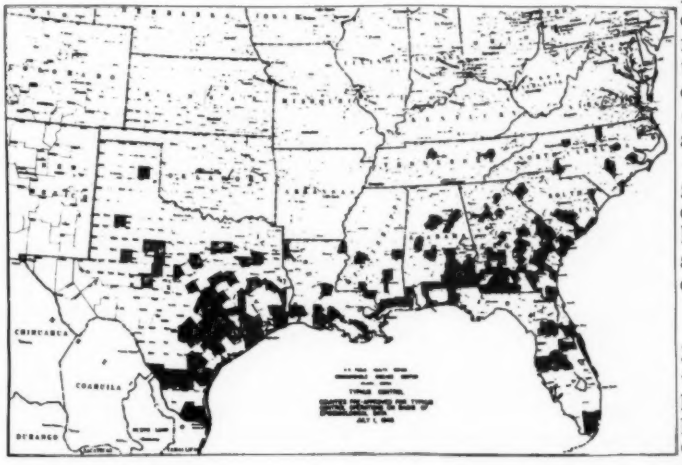
For the fiscal year 1946, beginning July 1, 1945, the Congress appropriated several times the previously allotted funds for typhus control primarily for DDT dusting in an attempt to stop the upward trend of typhus fever. Because of existing facilities and personnel in the office of Malaria Control in War Areas operating throughout the southern States, typhus control activities were transferred to that office on July 1, 1945.

[1] Read at National Pest Control Association 14th Annual Meeting, October 28, 1946, New Orleans, La.

Present Organization

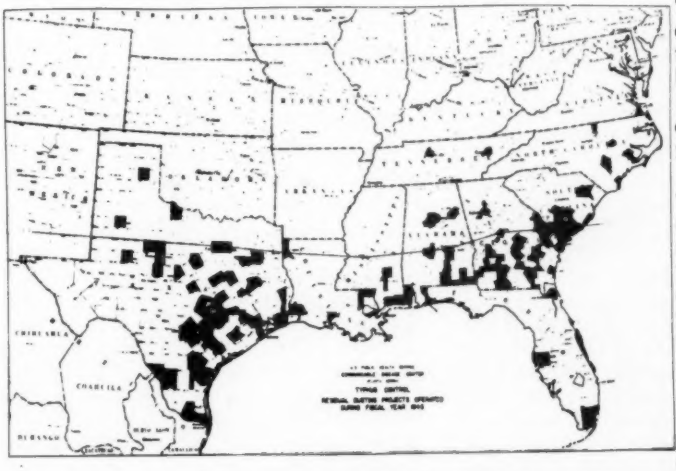
The expanded typhus control program reached full operation during the last 3 months of 1945 and is still functioning. The name of the headquarters office was changed on July 1, 1946, to the Communicable Disease Center because of the decrease in need for war area malaria control and the increase in scope of activities.

The Communicable Disease Center functions through Public Health Service District offices and the typhus control program is operated by and through the State health departments. Individual projects are conducted under the guiding policies of the local health officer. The Service assigns to the State health departments personnel who are in turn assigned to assist local health departments in developing projects. The Service, therefore, acts merely in an advisory, rather than a supervisory, capacity by assisting in hiring, training, and assigning personnel as needed, establishing certain broad criteria for operation, and disseminating information concerning typhus control procedures. The project itself must be the local health department's responsibility because a permanent program for typhus control requires continuous inspection and maintenance. Only those programs having local and State leadership and support will succeed.



[2] Counties Pre-approved for Typhus Control Operations on Basis of Epidemiological Data.

During the 5-year period 1941-45, cases of typhus were reported from 692 counties in 9 southeastern States. As funds were far too small to attempt control in all counties, the Epidemiology Division established a list of "pre-approved counties" for typhus control operations. It consisted of those counties with an average of 10 or more cases per year for the previous 5 years plus those counties with 10 or more cases reported during 1944 or 1945. The list, which included 140 counties, has since been expanded to 167 as additional counties met the requirements.



[3] Residual Dusting Projects Operated During Fiscal Year 1946.

To operate with Service personnel in a non-approved county, the State health officer must justify the need for typhus control operations to the Epidemiology Division. The 167 counties account for 81 per cent of all the

the reported typhus cases in the United States, and they are located in the 9 States of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas.

Ratproofing Projects Operated During and Prior to Fiscal Year 1946.

The distribution of projects coincides well with the preapproved counties. At the present time, Service personnel are assisting in DDT dusting projects in 123 counties. Many of these projects include rat poisoning operations. In addition, they assisted in 59 ratproofing and rat eradication projects during fiscal year 1946. The slide also shows 41 ratproofing and rat eradication projects in which the Service previously assisted but from which personnel have been withdrawn in order that the program may be continued locally.

Methods of Typhus Control

The following typhus control measures are recommended by the Public Health Service:

1. DDT Dusting for Rodent Ectoparasite Control.
2. Ratproofing and Rat Eradication in Business Buildings.
3. Good General Sanitation.
4. Rat Poisoning.
5. Maintenance.

DDT Dusting is accomplished by means of hand shakers or hand-operated dust pumps. Ten-percent dust is applied to rat runs, entrances, harborages, burrows, and other places that rats frequent. An average of 2.5 pounds of 10-percent dust with an expenditure of 0.69 man-hours per premise was reported in over 330,000 premise applications last year. Most of the dusting activities are conducted in and adjacent to business establishments with some in residential and rural areas. Dusting usually is combined with rat poisoning and, in order to prevent infected fleas from leaving dead rats and possibly causing human typhus cases, the application of DDT should precede poisoning by at least 3 to 5 days. Educational activities in rat food and harborage removal and in ratproofing accompany DDT dusting programs.

Ratproofing and Rat Eradication

in business buildings of cities and towns are very important parts of a permanent program for typhus control. One measure is not effective without the other, and both will fail unless they are properly maintained. All ratproofing and rat eradication programs which receive Service assistance, operate under the provisions of a ratproofing or typhus control ordinance. Ratproofing may be defined as a relatively inexpensive method of construction designed to keep rats from entering business buildings and to limit their travel from establishment to establishment as much as is feasible. It includes the closing or protecting, with ratproof materials, of all exterior actual and potential rat entrances together with such interior rat stoppage, harborage removal, and clean-up as may be deemed necessary to reduce or eliminate rat breeding and feeding places.

Rat eradication means the complete elimination of all rats in a building after it has been ratproofed. Most buildings can be ratproofed and freed completely of rats. Those that cannot be ratproofed economically should be serviced by continuous rat extermination measures.

It is essential that ratproofing proceed in an orderly manner until all business buildings within the city limits have been completed. Most construction work on rat-proofing programs is now being accomplished by city crews. However. it is believed that most health officers would prefer not to have the health department negotiate contracts for either ratproofing or rat eradication, if private industry can **and will** do the work. To encourage private industry, the Public Health Service assists State and local health departments in furnishing training and training aids for the purpose of instructing pest control operators. Furthermore, it now recommends that all items of expense for both ratproofing and eradication which would have to be incurred by private industry plus a 25-percent to 30-percent profit be charged if city crews provide the service. In addition, the Service recommends that provision be made in the annual health department budget for personnel to provide enforcement, education, and inspection services. Such permanently employed personnel will be required whether private industry or Government performs the ratproofing and eradication work. A good general sanitation program, systematic rat poisoning of alleys and residential areas, and DDT dusting should be integrated with the ratproofing program. But most important, ratproofing must be maintained. A completely ratproof and rat-free building will not remain so indefinitely. Such a building must be inspected at least every 45 days. If leaks are found or reinfestations occur, they must be promptly eliminated. By having maintenance contracts, Pest Control Operators can assist greatly, not by killing off large numbers of rats 6 months after they reinfest the buildings, but by keeping the building ratproof and rat-free from week to week and month to month. Even though a local health officer insists that city crews perform the initial operations, it is recommended to him that later contracts for ratproofing and eradication in the same building not be undertaken by the city.

Good General Sanitation, as it applies to typhus control, includes many measures which in themselves will do as much as rat poisoning in reducing the rat population of a city. Among these are the following:

1. Proper storage, collection, and disposal of all garbage and refuse.
2. Proper storage of food and feeds.
3. Cleanliness in eating and drinking establishments.
4. Harborage elimination in and adjacent to buildings.
5. Provisions of sanitary methods of excreta disposal.
6. Elimination of ramshackle buildings.

Usually, one city ordinance or another provides for the accomplishment of these measures. Frequent inspections, education of the public, and enforcement where necessary are required for a satisfactory sanitation program. These are the health department's responsibilities, but Pest Control Operators can materially assist the entire program by the education of their clients and by securing

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compliance with good sanitation principles through persuasion.

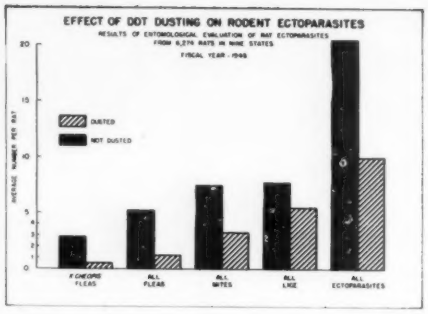
Rat poisoning is a necessary adjunct to the methods of typhus control already outlined. The most effective community poisoning program consists of the complete poisoning of all infested areas at one time. If this cannot be accomplished, each poisoning operation should cover as large a section as possible until all infested areas have received one complete poisoning. Each area should be inspected regularly for reinfestation, and poisoning repeated where new rat generations have developed. If good sanitary conditions are obtained and maintained, repeat poisonings of the entire city will not be necessary to control the rat population.

For the poisoning program to be successful, all food-handling establishments and residences should be provided with adequate containers for the proper storage of garbage. If poisoning is accompanied by other control measures, the placing of baits should follow DDT dusting but should precede ratproofing and harborage removal.

Maintenance is the regular follow-up of each control measure, and the health department is responsible for maintenance inspections. Unless rats are effectively controlled, DDT dusting must be repeated at about 3-month intervals during the typhus season. Ratproofing is unsatisfactory unless subsequent inspections are made to see that the buildings remain ratproof. Rat eradication also requires maintenance because even a rat-free building can become reinfested. Rats may gain entrance through open doors or in deliveries of merchandise. A single poisoning campaign followed by a thorough clean-up will be only temporarily effective if unsanitary conditions are permitted to return later. Frequent inspections, continued maintenance of good sanitary conditions, and repeat poinsonings in the necessary areas will prevent the re-establishment of the rat population as long as these measures are conducted.

Evaluation of Results

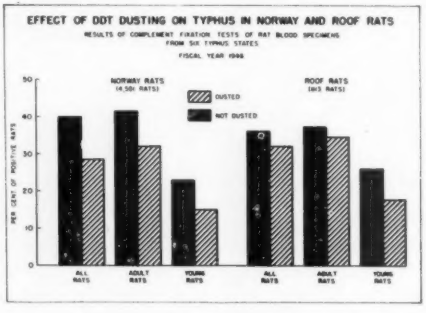
On DDT dusting projects live rats are trapped, combed, and bled in order to determine the effectiveness of control. The expectation, if DDT is successful in controlling typhus, is first a reduction in rat fleas and other ectoparasites, second a drop in typhus infection among the rats, and last a decrease in the number of human typhus cases. All ectoparasites from each rat are collected, identified, and counted. Results for the first year



Effect of DDT on Rodent Ectoparasites.

from over 6,000 rats showed a reduction of over 85 per cent in **Xenopsylla cheopis**, the most common rat flea. All fleas were reduced by 77 per cent. Rat mites and lice are reduced only about 30 per cent to 70 per cent by DDT dusting.

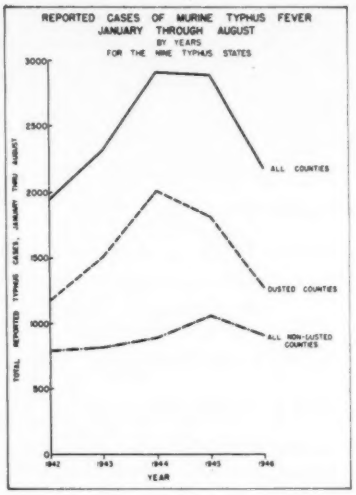
Rat blood specimens are centrifuged and the complement fixation test for typhus antibodies is performed on the sera. The test does not reveal whether infection in the rat was old or recent. In other words, a rat may be reported as positive, yet he may have had typhus 4 to 6 months before being trapped. Little control, indicated by complement fixation reactions, would therefore be expected until the generation of rats living at the time of dusting has been replaced. In the first year of operations, a 29 per



Effect of DDT Dusting on Typhus in Norway and Roof Rats.

cent reduction in typhus in Norway rats was reported. Young rats showed only a slightly greater per cent reduction than did old ones. Ten per cent reduction in typhus was reported in roof rats, with 32 per cent reduction in young rats, and 9.7 per cent in adult rats.

Reported human typhus cases decreased from 5,353 to 5,180 from 1944 to 1945. As of the last week in August of this year, there have been 2,296 cases reported in the United States compared to 3,050 cases for the same period in 1945. There were 1,270 reported typhus cases through August 1946, from the 123 dusted counties as



Reported Cases of Murine Typhus Fever January Through August by Years for the 9 Typhus States.

compared to 1,816 cases during the corresponding period of 1945. Although these figures represent a reduction in the number of cases following dusting operations, there was also a reduction from 1060 to 910 in cases reported from those counties in the 9 states which were not treated with DDT. It is, therefore, far too early to evaluate the effect, if any, of DDT dusting in the control of human typhus.

Of 105 rat-proofing programs, 34 have been completed and are actively maintained, i.e. 90 per cent of all business establishments being ratproof and rat-free. Fifty projects are continuing with the initial rat-proofing and rat eradication operations. The remaining 21 have been partly or entirely discontinued because of poor financing or collections, lack of maintenance inspections, loss of local supervisors, or lack of proper supervision. Nearly 4,000 establishments were rat-proofed in those programs to which Service personnel were assigned during the last fiscal year. An average of nearly 38 man-hours (labor and labor foremen) were spent in each establishment treated.

During last year, 113,000 premises, including rat-proofed buildings, were poisoned with an average expenditure of nearly 0.6 man-hours per premise. Most of these premises also were included in DDT dusting projects. Red quill baits and 1080 water, the latter in business buildings, were the primary poisons.

Policies

The Public Health Service is not normally an operational agency with respect to State or local health problems. The alarming increase in re-

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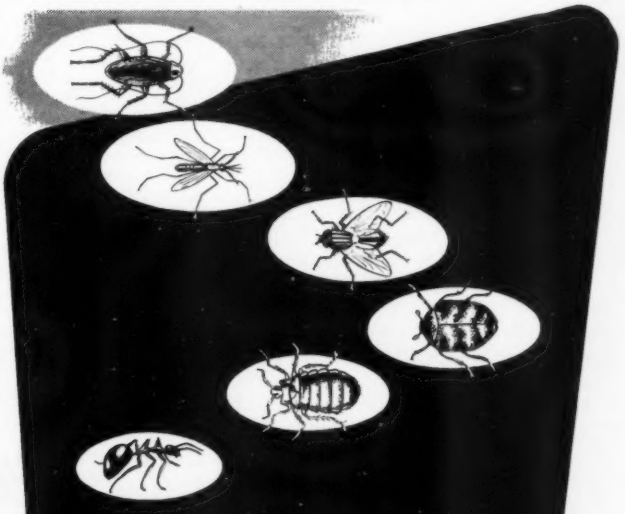

NO OTHER insecticide is nearly so deadly to cockroaches as this remarkable new development. Authoritative tests *prove* that a 2% solution of Velsicol 1068, used in the conventional direct spray method, results in a kill of 99-100%. Chapman Roach and Pest Killer possesses prolonged residual effectiveness as well. It is extremely poisonous to other pests, too—ants, flies, carpet beetles, silverfish, bedbugs and many others.

Chapman Roach and Pest Killer is supplied in either the ready-to-use solution containing 2% of Velsicol 1068, or in a convenient 20% concentrate, to be diluted with deodorized kerosene. For complete details on this powerful new insecticide, write us immediately.

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ported typhus fever cases necessitated the development of a fairly rapid control procedure and its immediate inauguration. The military forces depleted States of more than half of their personnel normally engaged in control or prevention of diseases. Personnel, therefore, were not available within the States for new or expanded programs. The Service attempted to fill the gap and to assist States in organizing and directing the expanded typhus control program.

As it is desired that each State and local health department be self-sufficient, Service policy requires a certain amount of local participation in all typhus control programs.

The principal functions of the Service are turning more towards training, research, investigation, evaluation, demonstration, and dissemination of information, rather than to operations. In the typhus States, the Service encourages rat-proofing and rat eradication activities by private industry. An example is the Houston, Texas, program in which the health department crews were terminated in August of this year. Cooperation is also sought from other agencies interested in rodent control, notably the U. S. Fish and Wildlife Service. In many programs the Public Health Service assists the local health department in DDT dusting while the Fish and Wildlife Service assists in rat poisoning.

Consultative and training services are offered to non-typhus States requesting assistance in establishing rat control programs. The Service also will collaborate in investigations to determine the extent and spread of rat-borne diseases. DDT dusting is not indicated in these areas unless plague is a problem, but all of the other four methods are recommended. In non-typhus States, a definite recommendation is made that rat-proofing be accomplished by private industry under an ordinance enforced by the health department. Examples of such programs recently started are at Richmond and Norfolk, Virginia, and Oklahoma City, Oklahoma.

It is the hope of the Service that the Pest Control Industry will demonstarte to health officials that it will become adequately equipped and trained to conduct rat-proofing and rat eradication measures on a community-wide basis. The facilities of the Service are offered to you in this endeavor.

Charles Pomerantz Addresses the N.J.P.C.A. on Mites

The November meeting of the New Jersey Pest Control Association again combined Association business and an educational feature.

The business session was taken up with the curricula of the Annual Rutgers Short Course and the Municipal Rat Program. Gratification was expressed over the fact that the activities of the New Jersey Pest Control Association were so well-known that it was logical for one of the largest municipalities in the State, which was confronted with a rat problem to seek the assistance of the Association and not some outside Governmental Agency. Hope was expressed that the program which the Association offered will prove beneficial to the city, its residents, and to the pest control industry. The members of the Association have pledged their fullest support to insure a successful program. The secretary then read a letter from another city, the officials of which became aware that a survey and a program for permanent rat control have been made in another municipality and they, too, requested that the same be done for them. The secretary was authorized to communicate with this second city and inform them that the Association would be very happy to co-operate with them.

The educational feature consisted of an illustrated lecture by Charles Pomerantz on his activities in solving the cause of the mysterious fever which broke out in a group of buildings in Kew Gardens, Long Island and which has already received a great deal of coverage in various periodicals. Some papers, in reporting these cases indicated that because of the rash which usually accompanied the fever, this disease was due to ticks but Charlie, in his personal investigations ruled out ticks and calculated that the epidemic was caused by a mite. To prove his theory Charlie received permission to inspect the buildings in which these mysterious fevers and rashes occurred, and after extensive inspection discovered some mites. Realizing the importance of his discovery he took these mites to Washington and there they were identified as Allodermanyssus sanguineus (Hirst). This mite has the ability to either desensitize or anesthetize the areas which it bites and therefore the host or victim is unaware that some organism is feeding on it. This trip to Washington resulted in a conference with Dr. R. J. Huebner of the U. S. Public Health Service at the New York City Board of Health where Charlie's theory about the mite being the vector of the disease was discussed and plans made to determine if his theory was correct. A laboratory was established in one of the basement rooms and Dr. W. L. Jellison, parasitologist of the U. S. Public Health Service at Hamilton, Montana was summoned to New York City. Soon thereafter, the officials were able to definitely establish the fact that the mites, which were living on the mice, and which thus were being carried into various parts of the building, were as Charlie suspected, the vectors of the disease.

Charlie went into detail about the phenomenon and the cause of an epidemic of insects and other arthropods. He explained the factors of the biotic potential as against those factors of environmental resistance together with man-made environmental-resistance. In this case, the favorable man-made biotic potential factors consisted of incinerators and seldom used stored materials. These offered the mice an abundance of food and shelter and were conducive to their propagation. Charlie gave a clinical description of those stricken with this heretofore unknown disease and compared this disease with the effects of diseases caused by other known mites.

One of the illustrations showed the bite on the arm of Dr. W. L. Jellison who himself was stricken with the disease in the course of his working on this problem. Slides were also shown of the laboratory, its equipment and of Drs. Huebner and Jellison of the U. S. Public Health Service working in the laboratory to isolate the organism which caused the fever. Charlie stressed that in his dealings with the officials, he wanted it definitely known from the very start that if his theory proved correct he wished full credit be given to the Pest Control Industry as a whole, and in particular to the National Pest Control Association, Massachusetts State College, the University of Montreal, Purdue University, Rutgers University and Fordham University, the institutions which made his education possible, and to Bill Buettner for his encouragement in his studies on ticks and mites.

At the completion of this address, time was allowed for questions from the audience. A motion for a rising vote of thanks was soon seconded and carried, and Charlie was congratulated for his outstanding work and perseverance. The chairman indicated that in spite of the credit which Charlie gives to the various institutions which made his education possible, it was felt that it was his own sincerity of purpose which enabled him to accomplish his endeavors which reflect so favorably on the entire industry, and which again proved how our industry is the second line of defense in guarding the health of our nation.

The audience consisted of representatives of real estate boards, faculty members of the University and health officials, in addition to the regular membership.

Toxaphene: New Insecticide

A new insecticide toxicant, Toxaphene, has been announced by Hercules Powder Company. Preliminary tests indicate Toxaphene is fully as effective as DDT against certain insects and more effective against others.

Toxaphene is a chlorinated camphene. For the past 18 months it has been undergoing tests in more than 75 different locations throughout the United States under the name, Hercules Synthetic 3956.

These extensive tests indicates that it can be used effectively in agricultural, household, and industrial insecticides. It is reported to be effective against such insect pests as cotton insects, tobacco horn worm, Mexican bean beetle, flies, clothes moths, and roaches.

Toxaphene can also be combined with Thanite, a Hercules toxicant possessing excellent quick "knockdown" properties, for use where both quick knockdown and residual properties are desired.

Toxaphene is, at present, available only to qualified testing agencies for experimental use.

Toxaphene is available in eight forms: Technical Grade, 25 per cent wettable powder, 25 per cent oil soluble concentrate, 50 per cent water miscible concentrate, 10, 20, and 50 per cent dust concentrates, and Thanite plus Toxaphene.

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*For list of insects against which **Octa-Klor** will be found effective see the next page.

OCTA-KLOR ($C_{10}H_6Cl_8$) will be found effective against the following:

Insects Attacking Man and Domestic Animals

Lone Star tick, the Brown dog tick, human lice, hog lice, chicken lice, cat and dog fleas, stable fly, Tabanids, Chrysops, ox-warble, horn fly and many species of mosquitoes.

Insects Attacking Growing Crops

Grasshoppers, squash bug, lygus bugs, chinch bugs, Pentatomids, Colorado potato beetle, cotton boll weevil, cotton boll worm, pea leaf miner, cotton leaf worm, hornworms, cabbage looper, imported cabbage worm, diamond back moth, flea beetle, corn ear worm, soil infesting insects, such as wire worms and white grubs.

Industrial - Institutional and Household Pests

German roach, brown banded roach, American roach, oriental roach, Pharaoh's ant, crazy ant, pavement ant, citronella ant, thief ant, fire ant, harvester ant, cornfield ant, carpenter ant, Argentine ant, bed bug, confused flour beetle, yellow meal worm, rice weevil, granary weevil, black carpet beetle, silverfish, firebrat, Collembola, earwig, European earwig, household spiders, household centipede, Brown dog tick, cat fleas, dog fleas, house flies, fruit flies, sewage flies, mosquitoes, psocids, hide beetle, larder beetle, bean weevil.

JHCo

NPCA POLICIES ON RODENT CONTROL

By **WILLIAM O. BUETTNER**, *Secretary, National Pest Control Association*

EDITOR'S NOTE: *This paper was presented as a part of the Rodent Control Symposium at the 14th Annual Convention of the National Pest Control Association held in New Orleans, La., October* 28-29-30, 1946.

THE policy of the National Past Control Association regarding Rodent Control might be summarized very easily, if there can be omitted details at the moment, by stating that there are three "parties" who must participate:

1—The **public** and this includes owners and tenants of buildings and areas immediately adjacent thereto whether they use structures for living purposes or businesses.

2—**Government** in the broadest sense and probably in particular those divisions of local, city, county, state and national charged with health, construction or buildings and sanitation, and augmented by an impartial research program.

3—**Industry** which includes contractors, manufacturers and distributors of rodenticides or other mechanical equipment, and pest control establishments.

Until some genuine efforts are made to bring personnel from these groups around a common table to discuss various responsibilities involved and a coordinated program of action put into effect, we predict that there will continue bickering, arguments, misunderstanding, duplication of efforts and a net result which will not achieve the desired end. Time and again we have found what amounts to nothing more than opportunistic strategies employed and the very natural tendency of one blaming the other for failures, shortcomings, and lack of cooperation. Perhaps this is what is meant by democracy. It is high time that we take our hair down and recognize that no single group or agency has the complete answer nor indeed should one have the effrontery to disregard any of the entities that can and must participate if results are to be attained. It is with much restraint that even now I am not mentioning certain cities nor singling out individuals by names and thus drive home concrete illustrations to prove the premises I have attempted to set forth.

By choice, therefore, I am confininging myself to the three "parties" who must participate if there is to be a sound solution to the problem of rat infestations, considering always the justification for action to reduce as much as humanly possible the rat and mouse population because of the diseases attributable to rodents and tremendous destruction to property of all kinds.

1—**The Public:** A consistent yearround vigilence to maintain sanitary conditions can only be expected as there is developed community interest. If careless practices with regard to unsanitary conditions are permitted in and around structures, and neighbors as well as employees of every manner of business are satisfied that such conditions continue, it follows that the sequence spelled out means: accumulation of debris, rat harborages, poor maintenance of structures, lack of adequate garbage and refuse disposal, etc. In short, the public must be rat conscious even though many individuals may never have seen a rat, much less ever found any evidence of rodent excreta or damage. It is the policy of the NPCA to bring about the highest possible degree of sanitation and we subscribe wholeheartedly to such a program.

2—**Government:** Three brief words summarize government function; namely, Inspection, Enforcement, Education and Research. When government goes beyond those fields, and we mean by this the intervention of "rat crews" which in some instances have and are attempting to be competitors with industry that in part foots the salaries and wages paid, it follows that industry rightfully injects protests and can find as many faults, sometimes more, than government blames on industry. How I would like to cite many illustrations to prove that point! We are discussing policies. The NPCA welcomes sensible government participation by way of inspections, enforcement and education. Sensible ordinances are necessary, if the hand of government is to be strengthened in a program of inspection and enforcement.

We are unalterably opposed to the phraseology presently in some ordinances, one of which reads:

> The director of health is empowered to contract with any owner receiving the notice in this section for the rat-stoppage with the use of the equipment and personnel of the Department of Health. The consideration paid by the owner shall be at least equal to the cost of labor, materials, and any other expense necessary to rat-stop said structure, and such consideration shall be paid in advance.
>
> The director of health is empowered to contract with any occupant receiving the notice described in this section for the eradication of rats with the use of the equipment and personnel of the Department of Health. The consideration paid by the occupant shall be at least equal to the cost of labor, materials, equipment, and any other expense necessary to free said structure of rats and such consideration shall be paid in advance.

It is very peculiar that in many cities, notably New York as will be evidenced by a photo-offset of many newspaper clippings that genuine progress and far more work was accomplished by the procedures which resulted in court action that brought over $100,000.00 in fines. These fines are the least significant part of the program conducted. What was accomplished by way of better sanitary conditions, rat-proofing, painting, etc. are the real achievements.

Sometime in the near future it is my hope to compile statistics and experiences which may serve the purpose of showing some of the sinister interests involved as government competes with private enterprise.

As PCO's we welcome a strong but sensible program of inspection, enforcement, and education and the attached approach to such is clearly stated in the "Rodent Control Program" which has been prepared by the Rodent Control Committe of our Association.

3—**Industry:** We recognize that merely because someone has rats, it does not follow that there must be called a pest control operator (it is natural that we would strongly suggest that one would be better off to call the PCO immediately). The point is that property owners and occupants may quite frequently, based on helpful literature available, proceed to block off means of ingress or use rodenticides and mechanical devices successfully. More power to such owners and occupants of structures.

As far as the NPCA is concerned, we believe we have issued to our membership, and industry at large, as much, if not more, information of a practical nature to be placed in the hands of experienced operators than

has been done by any others. That is of no particular credit to our Association. Rodent Control is an important function of our pest control activities. It follows, therefore, that we must keep abreast of new development (other professions do the same).

Let's be more specific: Members of our Association and many governmental officials who receive the service letters know how much has been submitted relative to rodent control. Particularly, Service Letters Nos. 360, 397, and 400 deal almost exclusively with policies together with helpful suggestions. It would be too lengthy a paper to read if I were to recite the 32 pages that comprise only the three service letters just mentioned.

Many other service letters likewise give pertinent information about rodent control. To be sure, our service letters attempt to broadcast those helpful facts of research that such governmental agencies as the U. S. Public Health Service, U. S. Fish and Wildlife Service, Agricultural Experiment Stations, Universities, and individual research personnel have developed. On the other hand, we are proud about some very practical field work done by the PCO's which adopted by others in our field bring results. At times we feel that perhaps we can more gracefully take a bow than be expected to bow to others.

But to come back to the NPCA policy as far as the PCO is concerned. Our rephrased "Standard Procedure for Rodent Control" is attached hereto. The PCO who does not follow this standard may be said to be out of step.

In conclusion, and without having given any concrete illustrations or cases of which we could cite many, as one of the three "parties" we take the position that we are as vital a factor, sometimes even more vital depending upon the situation involved, as the other two "parties," namely; the Public and Government, and therefore should be accorded a rightful seat in all deliberations and action to follow whenever there is a rodent problem requiring solution. We urge consolidation of information and above all the necessity of meetings of representatives of groups interested to plan adequate rodent control programs.

Rats Destroy Grain

Hamburg, Germany, Nov. 17 (Reuters)—Schleswig-Holstein, British zone province in Germany, is losing 50 tons of grain a day to 1,600,000 rats, said a dispatch from Kiel.

Chemicals and Pest Control

By L. S. DeATLEY,
Thompson-Hayward Chemical Company

EDITOR'S NOTE: *This paper was given at the Missouri PC Association meeting, by L. S. DeAtley, Daniel Boone Hotel, Columbia, Mo., August* 17.

AS never before the public is conscious of the pest control problem. Finally, the people have been fully awakened by the recent wide publicity devoted to the ravages of insects and rodents. Annual destruction of ½ billion dollars' worth of food by rats, damage of at least 50 million dollars to buildings by termites, the untotalled agricultural losses resulting from insect attack, the challenge to health and loss of life stemming from insect-borne diseases, and the general loss of well-being through repeated contact with household pests have incited an all-out war against these intruders.

Insect and rodent control by our armed forces during the war resulted in marked saving in life and materiel. Research, much of which was conducted under secrecy, bore fruit in the form of spectacular new insecticide and rodenticides.

These developments have stimulated the demand for professional pest control. The rapid introduction of new control agents requiring new application techniques and special precautions have placed this work beyond the range of the inexperienced layman. Thus the obligation of efficient pest control rests upon the shoulders of you and those of your profession more than ever before. Yours is the duty of acquiring current information of new developments and transforming this information into better and better results. Your prestige has ascended through the spreading knowledge of the importance of your work.

Some of you, unacquainted with the activities of my Company, may ask, "where do you enter this picture?" "Do you sell pest control? Do you manufacture DDT, 1080 or some other control agents?" Of course the answer is, "neither". Then where do we fit into this scheme which begins with chemical synthesis and concludes with pest destruction? Gentlemen, we're right in the very center of it.

First of importance to you we attempt to serve as a clearing house for information concerning new developments. We receive numerous scientific journals along with a large number of trade publications each month. Our laboratory staff searches for reports of new or improved products or processes of value to our customers. Many of these findings are carefully verified in our own laboratory. Then information concerning discoveries of merit is passed on to you and those in the other fields which we serve, either directly through technical bulletins or through our sales representatives.

Secondly, members of our staff are continually engaged in investigations involving the development of new products or the improvement of old preparations. For example, recently we have studied emulsifiers for DDT solutions, methods of preparing various DDT powders, and currently are engaged in certain roach and rat control investigations. Being in closer contact with the consumer than is the basic chemical manufacturer we are better acquainted with his problems and can provide prompt and useful technical service.

Lastly, we distribute basic chemicals and our own chemical specialties. By basic chemicals we refer to items such as sodium fluoride, potassium cyanide and DDT. Our own specialties include products such as roach powders, DDT liquids and dusts and rodent poisons.

Thus our contribution to pest control includes the dissemination of pertinent information, the improvement of control agents and prompt delivery of the needed control chemicals.

Now that we are well acquainted, let us turn to the consideration of some of the new control agents of promise.

Although well worn the subject of DDT is far too important to be omitted. A year's experience with its use now enables us to draw certain conclusions. Definitely it is an invaluable insecticide, however we all agree that it has limitations and is not the all-purpose product as originally heralded.

Probably its most valuable property to the pest control operator is its ability to destroy bedbug infestations.

Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,402,685 (June 25, 1946; appl. Apr. 13, 1940). CHEMICAL PROCESSES. Frank Ker Signaigo, Wilmington, Del. — E. I. du Pont de Nemours & Co., Wilmington, Del. — A process for the production of an aryl polysulfide comprises reacting an aromatic hydrocarbon with a sulfur halide in which the atomic ratio of halogen to sulfur is less than 2, in the presence of a metal halide boiling below 800° C., present in an amount approximately from 1 to 5% by weight of the sulfur halide, at a temperature between 25° and 140° C. They are useful ingredients for such materials as insecticides.

2,402,694 (June 25, 1946; appl. Sept. 19, 1940). CHEMICAL PROCESSES. Herbert G. Tanner, Wilmington, Del. — E. I. du Pont de Nemours & Co., Wilmington, Del. — The patentee claims a process for the production of thiols which comprises bringing a compound selected from the class consisting of organic sulfur compounds ni which the sulfur is joined to the organic radical by a plural bond, organic sulfur compounds in which the sulfur forms the bridge between organic radicals, and organic slfur compounds containing a sulfur-oxygen bond in which the sulfur is linked directly to an organic radical into contact with hydrogen, in the presence of a catalyst containing as an essential catalytic component iron sulfide, at a temperature between 100° and 300° C. and at a pressure in excess of 100 lbs. per sq. in. The products are useful as insecticides.

2,402,896 (June 25, 1946; appl. Nov. 15, 1944). INSECTICIDE. Theodore W. Kerr, Jr., Seymour, Conn. — United States Rubber Co., New York, N. Y. — An insecticidal composition containing 2,2-bis(p-chlorophenyl)-1,1,1-trichloroethane and an oily distillation product of the condensation product of monochlorobenzene with ethylene dichloride.

2,402,963 (July 2, 1946; appl. June 12, 1944). INSECT DEFLECTOR. James I. Hoag, Bloomfield, Iowa.

2,403,435 (July 9, 1946; appl. Jan. 30, 1943). PARASITICIDE COMPOSITION. Oscar H. Hammer, South Haven, Mich. — Dow Chemical Co., Midland, Mich. — A coarsely subdivided, free-flowing fumigant composition includes a dispersion of a volatile liquid fumigant in exploded mica, the average particle size of the mica carrier being at least 1/64 inch in diameter.

2,403,495 (July 9, 1946; appl. Feb. 10, 1942). INSECTICIDE. Charles Verne Bowen, Bethesda, Md. — Secretary of Agriculture. — A method for controlling insects comprises applying 1,4-diphenylthiosemicarbazide to the habitat of the insects.

2,403,945 (July 16, 1946; appl. Jan. 27, 1944). MILDEW-PROOFING. David M. Musser, Orange, N. J. — Pacific Mill, Boston, Mass. — A method of imparting a leach resistant, mildew inhibiting finish to a fibrous material comprises depositing on and between the component fibres of the material a relatively water-insoluble ortho hydroxy diphenyl compound containing an acyl radical selected from the group consisting of acetyl, propionyl and butyryl, said acyl radical being directly attached to the oxygenated ring of the diphenyl.

2,404,272 (July 16, 1946; appl. Nov. 27, 1943). TERMITE CONTROL DEVICE. Troy F. Childers, Joplin, Mo. — It is the aim of this invention to provide a device for the purpose of very completely impregnating the woodwork in buildings with a chemical wood preservative.

2,404,687 (JULY 23, 1946; appl. Feb. 26, 1945). INSECT ELECTROCUTOR. Guy Bowser, Pinellas Park, Fla.

2,404,698 (July 23, 1946; appl. Jan. 4, 1945). INSECT REPELLENT COMPOSITION. Alfred Dreyling, South River, N. J. — E. I. du Pont de Nemours & Co., Wilmington, Del. — An insect repellent composition of gel-like consistency has the following composition by weight: Ethyl cellulose, 2.7%; Cellulose acetobutyrate, 2.3%; Propylene glycol monostearate, 2.0%; Dimethyl phthalate, 55.8%; 2-ethyl hexane-1,3-diol, 18.6%; and Indalone, 18.6%.

2,404,856 (July 30, 1946; appl. Apr. 27, 1945). RODENT TRAP. Thomas G. McKeen, Torrance, Calif.

2,405,743 (Aug. 13, 1946; appl. June 27, 1945). INSECTICIDAL COMPOSITIONS. Samuel I. Gertler, Washington, D. C.—Secretary of Agriculture.—An insecticidal composition comprises 1-phenyl-2-phenylsulfonylhydrazine incorporated in a carrier selected from the group consisting of a mixture of a dust and a sticking agent and a mixture of a dust, a wetting agent, and water.

2,405,775 (Aug. 13, 1946; appl. June 8, 1942). INSECTICIDE AND FUNGICIDE. William E. Bradley, Los Angeles, Calif.—Union Oil Company of California, Los Angeles, Calif.—A process for the treatment of areas infested with fungus and insects, comprises spraying said areas with a material comprising a substantially pure isoparaffinic oil boiling in the range of about 350° F. to about 800° F.

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When carefully applied to mattresses and adjacent woodwork a 5% DDT spray not only eliminates the bedbugs present but also kills those which may creep from hiding several days later. This same type of application is very useful aboard trains and other conveyances. Normally a solution in deodorized kerosene is preferred for application to woodwork, but for treatment of bedding alone a 5% water emulsion is very satisfactory.

Varying reports have been issued regarding DDT for roach control. Unfavorable results usually can be traced to its slow rate of action. In general the findings indicate that when carefully applied as a 5% solution in a suitable solvent, as a 5% emulsion in water or as a 10% powder, DDT is as effective as Sodium Fluoride. Normally within a few hours after application some roaches are noticeably affected. However, about a week is required to show any marked reduction in the roach population. DDT offers an additional means of roach control, for in the form of a 5% residual spray it can be applied to surfaces and in places where use of a powder is precluded by its unsightly appearance.

For use by either the experienced exterminator or by the householder we feel that DDT Dusts containing some added material such as pyrethrum or a thiocyanate are much more satisfactory. These additives speed the kill and thus give greater satisfaction to the owner of the premises. In the formulation of a residual spray purely for roach control we do not recommend the addition of another toxic agent. In the first place any other insecticide employed would lose its effectiveness shortly thru volatilization or oxidation. Secondly it would increase the cost of the product needlessly.

Some research has been conducted with DDT for the control of termites. At present it appears that DDT is a termite repellent and that termites do not enter wood which has been treated with its solutions. How long this treatment will remain effective and how it will compare with other termite control agents can be determined only after long periods of exposure of treated timber.

In some homes and hotels the dog tick has become a household pest. In many fine dwellings these ticks can be found in furniture, beneath rugs, behind baseboards or along picture-moldings. Application of 10% DDT powder or use of 5% residual spray has proved effective in many instances. Of course the dog, too, must be treated if these pests are to be eliminated. Usually a DDT emulsion is selected for his treatment.

Possibly the major change in the technique of insecticide application following the introduction of DDT was the use of residual sprays. Altho a few insecticides were advocated for residual use before the advent of DDT their effective periods were very short. An application which remained toxic for weeks and even months was an innovation. Now some persons wish a spray which will serve both as a residual agent and as a "space" insecticide. A product of this type can be produced, but in our opinion it is uneconomical, particularly from the standpoint of the large user.

In a residual spray it is added expense to include a quick knock-down agent which will be lost a few hours after application. Similarly, in a space spray it is unwise to include as much as 5% DDT when only ½ of 1% is required to produce 100% kill by the Peet-Grady method. In the latter spray, where the knock-down effect is important, we feel it is much wiser to use an effective amount of quick acting toxicant and maintain the DDT at a minimum.

To those of you who manufacture finished DDT preparations we offer a few suggestions. We trust that you will not attempt to prepare DDT powders by merely mixing technical DDT with inert carriers. In such cases the DDT particles are much too coarse to exhibit their maximum effectiveness. On the other hand excellent results can be obtained by admixing an effective carrier such as talc or diatomaceous earth with a finely ground DDT dust concentrate. Usually a concentrate containing 50% DDT is used. Many of the concentrates available have particle sizes ranging from 2 to 5 microns, much smaller than the openings of a 325 mesh screen which measure 44 microns.

If you formulate liquid DDT products it is well to investigate the freezing point of your finished insecticide. Possibly a portion of the DDT may crystallize from solution in the water, and the material withdrawn from the top of the container will lack effectiveness. Further, we Americans are very particular about odors, so select a solvent which is not unpleasant. Many good solvents are available and the few cents extra paid for a quality diluent is readily recovered in the profit from repeat business.

A great deal of time has been spent in discussing the toxicity of DDT. The press has devoted considerable space to this feature. Many persons have diagnosed their aches and disorders as being "DDT poison". From the National Institute of Health we learn that of the many cases of suspected DDT poisoning brought to its attention none has been discovered in which the symptoms were believed to be the result of DDT itself. Many of the cases were due to the effects of the solvents employed, which have caused both skin irritation and more pronounced disorders. It has been stated by investigators "that DDT is definitely less toxic than paris green or sodium fluoride. Nevertheless DDT has toxic properties which require certain precautions in its use." You of the pest control profession are well acquainted with the careful handling of all insecticides and certainly should never experience any difficulty with DDT.

Now let us turn to some of the newer preparations, not yet offered in commercial quantities, but which hold great promise for certain applications. The first of these, a product of British research, is commonly known as Benzene Hexachloride. Also it may be referred to as "Gammexane", "Hexachlorocyclohexane" or simply as "666".

Although a method of manufacture of Benzene Hexachloride was patented in this country by the British in 1940 it appears that its insecticidal value was not recognized until 1942. It is prepared from one of our common raw materials, benzol or benzene, by a process of chlorination.

In March, 1945 Dr. Slade reported to the Society of Chemical Industry in Liverpool results of the initial work with Benzene Hexachloride. At first results were very erratic as certain batches of this chemical proved to be considerably more effective than others. Further research indicated that commercial Benzene Hexachloride consisted of a mixture of several isomers. Now isomers are closely related chemical compounds which have the same composition from the standpoint of the number and kind of atoms present per molecule but differ in the positions of the atoms in the molecule. As a crude example we can form a circle using four red marbles and four blue marbles. It is immediately apparent that there are many ways in which these marbles can be arranged in a circle without varying the total number of each kind present. Although this illustration is more general than the normal chemical concept of isomerism, it does help us to understand the various structures possible in chemical compounds.

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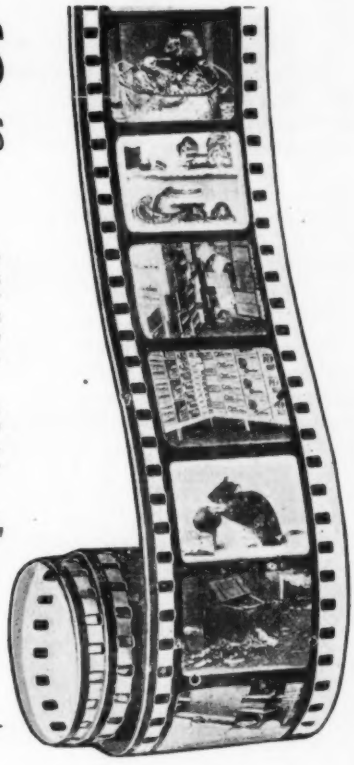

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ORIGINATORS OF DDT INSECTICIDES

A continuation of the experiments with Benzene Hexachloride illustrated that it consisted prineipally of a mixture of 4 isomers which were denoted as Alpha, Beta, Gamma and Delta. Further work proved that the effectiveness of this material resulted mostly from the presence of the Gamma isomer. Means were then devised to isolate and purify this component.

When first announced in this country by the American Press Benzene Hexachloride was described as a "Super DDT". This statement was partially justified by some insecticidal tests made with the Gamma isomer which ranked it from 8 to 15 times more effective than DDT in the control of some insects. Among the more susceptible pests were grain weevil, house flies, locusts and certain cotton insects. Benzene Hexachloride is triple acting, serving as a stomach poison, contact insecticide and fumigant. A further advantage lies in its low toxicity to warm blooded animals. It is reported to be approximately 1/15 as toxic as DDT.

To serve as a fumigant it is apparent that Benzene Hexachloride must be fairly volatile. This property is a disadvantage when its value as a residual spray constituent is considered. Its residual effect lasts only a few days as compared with a matter of weeks in the case of DDT. Also the experimental Benzene Hexachloride now being produced in this country possesses a noticeably objectionable odor. Perhaps as the manufacturing technique is improved this feature can be eliminated.

Benzene Hexachloride has been suggested as a replacement for DDT in Aerosol Bombs, for only 1/8 to 1/10 as much would be required to produce equivalent results. When offered commercially, Benzene Hexachloride probably will not affect DDT consumption greatly. Some may be used in conjunction with DDT, it may replace rotenone in some instances and in other cases it will serve in fields where arsenicals or other inorganics previously were used.

The experimental Benzene Hexachloride now available contains about 10% of the Gamma isomer. Manufacture is restricted to pilot plant operations but next season we will witness larger scale production. Satisfactory results with an insecticide abroad do not guarantee equivalent success in this country so it is necessary that many field tests be completed before manufactures are willing to invest in the equipment needed to synthesize this new control agent.

A purely domestic contribution to the insecticide field is 1068. This product is now available in commercial quantities. Although its exact chemical formula has not been reported, it appears to be the result of the exhaustive chlorination of napthalene. Thus it is a close relative of Benzene Hexachloride. From work reported in the March issue of the Journal of Economic Entomology, 1068 is 3 to 5 times as effective as DDT in the control of certain insects. However in a series of tests conducted with the larvae of the Anopheles Mosquito, DDT, Gamma-Benzene Hexachloride and 1068 appear to be equivalent.

One predominant advantage of 1068 is its excellent solubility in kerosene and similar solvents. Unlike DDT and Gamma-Benzene Hexachloride it dissolves in practically all proportions in the common diluents. Its main disadvantage at present is its cost. Also there is a possibility that sprays containing this ingredient may leave a slightly sticky residue as the concentrate is of a molasses-like consistency.

1068 offers some promise in the preparation of residual sprays as it is less volatile than Benzene Hexachloride. On the other hand it lacks the permanency of DDT applications. As much of the recorded experimentation to date with this compound has been based on small scale tests, larger commercial results must be considered before definite conclusions are possible.

Investigations of German chemical developments were made by American scientists promptly after the capitulation of the Nazis. Among the reports of these investigators were a number of accounts of insecticide research and production. Considerable emphasis had been given to DDT although raw material and production problems had forced the use of other agents. One German development was "Gix" which chemically is Difluro-Diphenyl Trichloroethane as compared with DDT which is Dichloro-Diphenyl-Trichloroethane. This compound is reported to be about 7 times more effective than DDT but unfortunately is about 10 times as expensive when produced by the German method.

Other developments included Lauseto-Neu, a mixture of two organic chemicals. This product reputedly is a valuable mosquitocide but is rather ineffective as a fly killer. Also new members of the moth repellent family of Eulans were uncovered by our investigators. In addition other insecticides of less interest to the pest control profession were reported.

Many of these developments are being carefully studied and evaluated by laboratories in this country. Thus we can expect those agents which prove to be economically sound and high in insecticidal activity to be available in a reasonable time.

Although actually a branch of insect extermination, termite control is rather distinctive in the methods employed. Unfortunately it appears that this field has not received the same amount of attention devoted to other branches of pest control. Many old reliable agents such as Coal Tar Creosote Oil, Wood Creosote Oil, Orthodichlorobenzene, Arsenicals and other inorganic chemicals still are used regularly to reduce termite attack. Fairly new agents are pentachlorophenol and certain related chlorinated phenols. Dissolved in suitable solvents and diluted to approximate 5% concentration these phenolic compounds are suitable for application to wood by dipping, brushing or spraying. By evenly covering the wood surface termite damage as well as destruction by certain fungi can be prevented for long periods. Fortunately these protective compounds possess practically no odor and the residue can be painted over without damage to the paint film. The value of an odorless product is obvious. Other termite poisons have been reported in the chemical literature but apparently have not reached the commercial production stage as yet.

In the formulation of insecticidal products all of us generally err by placing all of the emphasis on the active material. Actually the entire success of the product may depend upon the use of the proper carrier or diluent. Too often we select the inert constituent on the basis of cost rather than considering its contribution to the proper action of the product.

In roach powder formulation the carrier is important from the standpoint of its action on the insect and its performance during application. A carrier which does not adhere to the covering of the insect may render a dust useless. A powder which produces a fog throughout the premises treated would be immediately rejected by the owner. Further a carrier which accelerates decomposition of the active ingredient must be avoided. All these features must be carefully studied before a decision is reached as to the proper dust formulation. Even tho one type of talc may be found very useful in a particular preparation, another grade may be valueless.

In the development of liquid insecticides the diluent or solvent plays just

as important a role as does the dry carrier in powdered products. Diluents which are highly inflammable, damaging to the skin, whose vapor is irritating to the respiratory system or which react chemically with the active agent reducing its toxicity to insects must be avoided. In other instances the solvent must be selected on the basis of its odor, non-solvency for painted or varnished surfaces, evaporation rate, compatibility with other diluents and non-staining proportion. These requirements cannot be considered too lightly for only thru proper choice can a high grade well accepted product be developed.

Fortunately for us who are interested in pest eradication the field of rodent control has received attention equivalent to that accorded insect destruction. Many exhaustive investigations were conducted during the war, for it was vital that the rations and the fighter himself be protected from these unrelenting enemies.

First attention was given to the improvement of the existing rodenticides. The loss of red squill from the Mediterranean and the appearance of weak shipments of squill encouraged the Fish and Wild Life Service of the U. S. Department of Interior to investigate means of strengthening and improving available stock. Methods of extraction and fortification of red squill were developed, and these helped considerably until more potent chemicals were available.

By 1942 a shortage of all rodent toxicants became so acute and the need for rodent control so urgent that extraordinary steps were required. Under the sponsorship of the office of Scientific Research and Development and with an expanded budget the Fish and Wild Life Service was assigned the task of promptly developing an efficient rodenticide from available materials. Over one thousand substances were screened and many exhaustively examined. Some showed promise but not until 1080's turn arrived were the investigators greatly encouraged by their results. This compound was Sodium Fluoroacetate. It passed the screening test with ease and it elated scientists by its exceptionally high toxicity. Of course, as we know, this is but one requirement for a pest control agent. It is worthless if its odor or taste prevents rodents from accepting it. Surprisingly, rats were found to consume 1080 without hesitation. In fact they seemed to prefer water which contained it over the unpoisoned liquid. Thus a new rodenticide was born.

Even with its value as a control agent established, 1080 was not ready for release. Still unanswered were the questions of its toxicity to human beings and domestic animals. Unfortunately man was found to be very susceptible to 1080 and 1/50 of an ounce was estimated as a fatal dose. Further no antidote for the poison was known. Thus offering this miraculous new rodenticide to the public would compare with the indiscriminate sale of potassium cyanide.

Because of the need for great precaution in the use of 1080 it was released at first only to certain agencies engaged in its evaluation. Later when its manufacture was expanded the producer developed a very restricted sales policy which included only properly insured pest control operators and agencies of the State, County and City governments. This is a distinct compliment to those engaged in pest control activities. You are entrusted with an extremely valuable weapon and upon you mankind depends for careful attention to its proper use.

Not all the useful compounds are the result of the intensive search which preceded the discovery of 1080. Often unexpected results appearing in a scientific investigation lead the researcher in unintended paths. This is especially true if the investigator is alert and willing to pursue the unexpected when it appears. Dr. C. P. Richter of Johns Hopkins Hospital was such an individual.

Dr. Richter was studying the taste thresholds of human beings. Preliminary investigation involved the use of rats, which we know are unique in their ability to select good food and reject poisons. One chemical used in the test tastes bitter to some individuals but is tasteless to others. It was this chemical, Phenylthiourea, which when fed to rats led to a startling discovery. To some laboratory rats this compound was not objectionable. They consumed it readily with food, but to the amazement of Dr. Richter they were all dead the following day. By wild rats it was rejected. Apparently it was bitter to them as it is to some human beings.

This led to the investigation of related phenylthiourea compounds. Twenty-four of these were examined. One, Alpha - napthylthiourea was found to be acceptable to all other rats tested and particularly deadly to the common Norwegian rat.

Like 1080, this compound, christened "Antu" for short, was examined for toxicity to animals. Except to dogs and swine Antu is considerably less toxic to other animals than to rats, extremely large quantities being required to kill cats, chickens or monkeys. Since monkeys react similarly to human beings in Pharmacological tests Antu is considered safe for use when reasonable precautions are taken.

Shortly after consuming Antu rats exhibit an increased desire for water. Within an hour their activity has been greatly reduced and they are breathing heavily. Death may occur within a few hours to 48 hours depending on the dose consumed. Post mortem findings indicate an accumulation of fluid in the chest cavity. They literally drown in their own body fluid.

Antu is a white to greyish powder which mixes readily with baits of all types or with inert powdered diluents. If a poison bait is desired 3 to 5% of Antu may be mixed with ground meat, meal or both. Also the powder may be dusted on attractive morsels of food common to premises where rats abide. Also Antu in the form of 25% powder may be dusted lightly over the surface of small drinking water cups which are placed at strategic points. Another very effective method of control is to dust a 25% Antu power over areas normally traversed by rats. Almost invariably this gives positive results. Antu powder clings to the feet of the rodent and later is licked off. The latter method is not dependent upon the availability of an attractive bait, and it promises widespread use.

Only 1/500 of a gram of Antu is needed to insure the death of an adult common Norway or brown rat. Unfortunately the common mouse and the Alexandrian species of rats require considerably larger doses. It is essential that a sufficient quantity of Antu be consumed to destroy rats with the first dose. If this is not done it appears that an immunity is developed to Antu which lasts for several months.

Because of its low toxicity Antu can be compounded into preparations for use on the farm. By exercising the same precautions used in handling sodium fluoride or DDT an individual can conduct his own rodent eradication campaign where professional pest control services are not available or practical. Soon baits containing Antu and particularly the Antu powders will be available in packages suitable for the consumer. Many of you will wish to offer these products properly compounded and carefully labeled as a supplement to pest control service.

As in the case of insecticides a number of new rodenticides were developed by the Germans during the war. Full information on composition and

methods of production of these agents is available to the American Chemical Industry. Possibly some will survive the rigorous tests to which they are to be subjected and eventually will reach our hands. We can be assured that they will possess outstanding properties if they compare favorably with our recent developments.

If in the last five years only those discoveries bearing upon the pest control industry had been made we still could state that civilization has made a great advancement. To us new control agents are commonplace but to the public they are marvelous discoveries with which sensational results are possible. Thus with these tools available to you the public expects more and more effective pest control. Great opportunity now is yours but accompanying it is equally great responsibility.

NAIDM Convention Sets Attendance Record

The thirty-third annual convention of the National Association of Insecticide and Disinfectant Manufacturers attracted a record registration of 480. Actually, however, there were well over 500 in attendance at the 3-day meeting held at the Hotel Commodore, New York, December 2, 3 and 4, 1946.

Chief interest centered around newer insecticides such as 666 and 3956; Antu, a new rodenticide, proposed uniform state insecticide and fungicide model law, restaurant and food sanitation and the expanding market potential for aerosols.

Following the address of President N. J. Gothard and the report of Secretary H. W. Hamilton (both of whom were re-elected), at the opening session on Monday morning, Dr. Alfred Weed of the John Powell Co., N. Y., brought the convention up to date on the effectiveness of Benzene Hexachloride (666) as an insecticide. The odor of 666, Doctor Weed noted, is a deterrent in its use for household pest control.

Dr. Israel Weinstein, Commissioner of Health, N.Y.C., opened the afternoon session with a constructive talk on "Restaurant and Food Production Sanitation." In it he stressed the importance both of proper design and construction of restaurants and effective control chemicals in achieving worth-while sanitation. Effective pest control, Doctor Weinstein advised, was a matter of co-operation among insecticide manufacturers, PCOs, public health departments, as well as restaurant and hotel management. Turning to labels, Doctor Weinstein urged that they should indicate how effective a product is, what it can be used for, and precautionary advice in its use. In concluding, Doctor Weinstein urged the manufacturer not only to be interested in the sale of his product but also at the point where it is used. He offered the manufacturers his utmost co-operation, and agreed to make available to them the health department's findings pertaining to pest control and sanitation.

In his paper "Tests of a Chlorinated Bicyclic Terpene (3956) Against Household Insects," in format a lantern-slide presentation, Dr. L. A. Stearns, University of Delaware, Newark, Del., detailed differences and similarities in toxicity, residual effect between 3956 and DDT against a number of insects, such as the German roach, black carpet beetle, furniture carpet beetle, house fly, webbing clothes moth, bedbug, etc.

Both 3956 and DDT, Doctor Stearns declared, proved equally and highly toxic to the house fly; adding, that both chemicals are relatively slow-acting, and that both display a marked residual effect. Against certain household insects, Doctor Stearns pointed out, the effectiveness of 3956 approximates that of DDT.

W. D. Tiedeman, Chief, Bureau of Milk Sanitation, State Health Department, Albany, read a paper "The National Sanitation Foundation" prepared by Dr. Walter F. Snyder, School of Public Health, University of Michigan, Ann Arbor, Mich. Doctor Snyder touched on the purpose of the Foundation, a non-profit organization set up in November, 1944. Its basic function, he stated, was to eliminate confusion in matters of proper sanitation, to bring together leaders in industry, public health, etc., to further and encourage research to the end that environmental health in the U. S. be improved. All who have a stake in environmental sanitation, Doctor Snyder stressed, must participate; adding, that education, rather than the police method, is more effective in protecting public health.

Highlight of the Tuesday morning meeting was a stirring talk by William Laurence, Science Editor, "New York Times," N. Y., on "Our Heritage of Atomic Science," in which he fervently urged world adoption of the Baruch or American, as he preferred to call it, plan of atomic control. His subject matter proved of profound interest, drawing numerous searching questions from an overflow audience.

"The Proposed Uniform State Insecticide and Fungicide Model Law" was discussed at the Wednesday morning session by W. J. Zick, B. Heller & Co., Chicago, Ill., Chairman, Legislative Committee. Purport of the suggested law, Mr. Zick, declared, was to protect user and seller of economic poisons, to serve as a working basis for State legislatures contemplating kindred legislation, and to resolve contradictory State laws, particularly with reference to labeling requirements, coloring of insecticides, etc. In the main the proposed model law, with one exception, followed the Federal bill introduced in Congress in '45, Mr. Zick reported.

Dr. James C. Munch, Munch Laboratories, Upper Darby, Pa., was the next speaker. He discussed Antu, the new rodenticide, outlining its history, toxic properties and variations in effectiveness against the Norway rat, etc., advising that if less than a killing dose of Antu were eaten by a rat, it would develop a tolerance against the poison for at least a month. Doctor Munch asserted it takes three times as much Antu to kill the male rat as it does the female. Warning of its toxicity to man, dogs, cats, chickens, pigs, etc., he added that six pounds of Antu should be enough to kill 1,000,000 rats. While thus far, Doctor Munch continued, no cases of human Antu poisoning have been brought to his attention, nevertheless, he warned that it was potentially dangerous and that special care should be used in its sale and application. He also discussed antidote treatment should a case of Antu poisoning develop.

An interesting and constructive talk on "Sanitation Control in Food Establishments in Canada" by A. G. Macnab, Sanitary Engineer, City of Westmount, Montreal, Canada, wound up the morning session.

Featuring the final or Wednesday afternoon session was a symposium on aerosols, with John H. Mills, of the Bridgeport Brass Co., Bridgeport, Conn., and chairman of the aerosol committee of the association, presiding. The symposium opened with a paper covering technical and research developments in "Insecticidal Aerosols" by Dr. E. R. McGovran and J. H. Fales, U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Beltsville, Md., and presented by the latter.

This was followed by an informative talk on "The Expanding Field for Aerosols" by Dr. Waldemar Dietz, Bridgeport Brass Co., and read by H. R. Shepherd of the same firm. Doctor Dietz called attention to the fact that larger (than one pound), tailor-made aerosol units are indicated for institutional and industrial usage, particularly in the fur, greenhouse and florist trades. Aerosol units will also find application in the cosmetic, germicide and fungicide industries, among others, Doctor Dietz predicted.

A question-and-answer forum occupied the rest of the symposium, with the following on the receiving end: Dr. Paul A. Neal, Chief, Industrial Hygiene Laboratory, U. S. Public Health Service, Bethesda, Md., Dr. Frank Hazard, Wilmington, Ohio, H. E. Peterson, Research Dept., Continental Can Co., Chicago, Ill., R. E. Ditsler, Westinghouse Electric Corp., Springfield, Mass.; and W. G. Reed, S. A. Rohwer and Doctor Stearns of the U. S. Department of Agriculture.

"Insect Repellents", a comprehensive and instructive paper (lantern-slide illustrated), by Dr. Michel Pijoan, (USNR) University of Colorado, Boulder, Colorado, was the last of the formal talks of the 3-day meeting. Doctor Pijoan stated that to date the ideal repellent for all environmental conditions and all insects is not known.

The following officers were re-elected:—
President, N. J. Gothard, of the Sinclair Refining Company, East Chicago, Ind., first vice-president, Gordon H. Baird, of Baird & McGuire, Inc., Holbrook, Mass.; second vice-president, A. W. Morrison, of the Socony-Vacuum Oil Company, New York; treasurer, John Powell, of John Powell & Co., New York, and secretary, H. W. Hamilton, of the Koppers Company.

The midyear meeting will be held in the Edgewater Beach hotel, Chicago, June 9-11.

A reception followed by an informal dinner, which included a first rate floor show, were held on Wednesday evening.

PCOs and officials of the N.P.C.A. in attendance were:

Kenneth McLeod, McLeod Industrial Fumigators, Buffalo, N. Y.

Guy P. Robbins, Puritan Specialties Co., Cambridge, Mass.

Paul Robbins, Puritan Specialties Co., Cambridge, Mass.

Ted Oser, Orkin Exterminating Co., Atlanta, Ga.

Charles Pomerantz, Bell Exterminating Co., N. Y.

William O. Buettner, Secretary, Brooklyn, N. Y.

J. Edwin Sameth, Western Exterminating Co., Newark, N. J.

P. Calvert Cissell, American Disinfectant Co., Washington, D. C.

Sidney Wimmer, Majestic Chemical and Ext. Co., N. Y.

E. N. Goldey, Bliss Exterminator Co., N. Y.

Joe Finneman, Pest Control Corporation, and president, PEA, N. Y.

L. Weintraub, Astor Exterminating Co., Boston, Mass.

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Lasker Group "Oscar" Awarded to Bureau of Entomology and Plant Quarantine

A Lasker Group Award was presented to the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, by the American Public Health Association, at the 1946 convention of public health workers held November 12, in Cleveland, Ohio. Engraved on the award, a silver replica of the famous statue "Winged Victory," are the words, "In recognition of distinguished service in the solution of problems involving the health and comfort of the armed forces, with particular reference to insect-borne diseases."

Dr. F. C. Bishopp, Assistant Chief, In Charge of Research, of the Bureau of Entomology and Plant Quarantine, received the Award for the Bureau. Dr. Bishopp is a specialist in the field of medical entomology and he had the overall direction of the research conducted by the Bureau for the benefit of the armed forces. Three divisions of the Bureau carried on the research. Entomologists and chemists, working mainly at the Agricultural Research Center at Beltsville, Md., and at the Bureau's laboratory at Orlando, Fla., were responsible for the success of the research program.

The citation which accompanied the award states "Early in the war, the Bureau of Entomology and Plant Quarantine, at the request of the United States Army, undertook the discovery and development of methods of control insects responsible for spreading diseases of particular significance during wartime. Outstanding among these was the search for more effective and practical methods of controlling body lice (typhus) and . . . mosquitoes (malaria, yellow fever, dengue, filariasis, encephalitis, etc.) Specialists skilled in the identification of insects assisted the armed forces by the identification of thousands of . . . insects, mites, and ticks suspected of carrying diseases and by training military personnel. This was part of a program which involved the testing of some 10,000 compounds and the ultimate discovery and adoption of several, including the aerosol bomb, which has been of inestimable value in combatting malaria (and other insect-borne diseases). . . . The Bureau conducted basic experiments which resulted in the development of dimethyl phthalate and later benzyl benzoate . . . effective in high degree against the mite carriers of scrub typhus . . . undertook studies (on DDT) which were influential in its use in the prevention of epidemic typhus fever among our troops. . . . Equipment was devised by the Bureau for the dispersion of DDT insecticides to meet various field needs. . . . Not the least of the achievements of the Bureau has been . . . its research and control operations against insects of agricultural importance . . . helping to assure an adequate food supply for the armed forces and those behind the lines. The American Public Health Association cites these achievements of the Bureau of Entomology and Plant Quarantine as a notable contribution to the public health."

President Truman, in a letter dated November 7, 1946 regarding the Lasker Awards stated, "We try to take care of our people who are ill, but the greater wisdom would be to bend our greater effort to keep them well by spending money to find not only the cure of disease, but its cause and prevention." It is, of course, more logical and more effective to control disease-carrying insects than to try to cure humans after the insects have caused their disease.

Impressions on the 14th Convention

By REV. FATHER OVILA FOURNIER

I was fortunate indeed to attend the 14th Convention at New Orleans, and I feel deeply indebted to the NPCA for the warm hospitality I enjoyed there.

Here are a few notes I gathered during the meetings:

1. The recent World War has proved that theoretical science is close to, is hand in hand with, technology. For example, radar and the atomic bomb are mere applications of pure science. But what the recent war has set forth was already routine with pest control operators. From the beginning of this association, university professors have been called upon to help technicians in their work against vermin. I do not know of any instance of a similar collaboration.

2. I have no mandate to speak on behalf of the university professors, but, as far as I am concerned, I harvest great information from these conventions, for I come to realize what problems the operators are meeting and I endeavor to improve my own teaching and research so as to better train men for the problems with which they will have to deal when they go proudly out from our institution with their diplomas. If the presence of university professors helps the operators in Convention, so the presence of the operators likewise is of value to the professors.

3. After one of the sessions, I was in a mood for dreaming, and my imagination wandered about the work of the convention. I asked myself: "What is a good service man? What qualifications are essential for his work? Skill? Patience? Physical Training? Scientific background? Could a biological profile of the ideal operator be set up? Would it be of any help in choosing new operators? Is it preferable to rely on the intuition of the manager? As an outsider without any experience, I imagine that chemicals are important for a good job, but to what extent? 10%? 50%? These insecticides must be applied properly, and here the importance of the man bearing the spray gun enters in. I wonder if the biological profiles set up for other trades could be worked out for the pest control service man; would a personnel selection quiz, or clinic, be of any use in the coming conventions?

Finally, I may honestly add that I have had the privileges of attending many conventions, but none as successfull as the last, probably partly because of the atmosphere and climate of New Orleans, but also because the members were conscious of the importance of a convention and the benefits one harvests from it. One of the most durable steps is the four years course already offered by two universities. I agree with Prof. J. J. Davis when he says that you are professionals, and your association will embody a greater and greater number of college men. Knowledge is your leitmotiv. Knowledge will lead you to greater success.

Tenant Appeals to PCO

(The following note, undoubtedly written in a humorous vein intentionally, was left by a Washington, D. C. tenant for the exterminator servicing the apartment house in question. It is our understanding that the apartment was serviced on September 11 and a later check back revealed that the tenant had not seen anything since the treatment. ED.)

Exterminator: We're seriously thinking of hiring an entomologist to analyze the various bugs we find in the house. A small black variety and a tiny, almost colorless specimen seem to have invaded our ant hill. The little black ones lurk in the dish cabinet above the sink; the tiny white ones have a fondness for paper. However, we'd settle for those little ones if we could get rid of the ants, who lurk everywhere and have a fondness for everything. They seem to anticipate all our moves; when we set the table for dinner they're sitting on the plates waiting for their share of the food; they wash in our basins, wipe their feet on our face towels, and are all dressed in pajamas and ready for bed long before we are. They get into our under and outer clothes before we do, they explore chests of drawers, closets, books—nothing is out of bounds to them. Please!—isn't there anything you can do or suggest that we do to get rid of them? We'd be eternally grateful. We seem to have gotten a mass migration to the bathroom recently—but they certainly didn't come from the closets, chests, kitchen or dinette—.The original settlers are still there!

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Termite Test Table

We regret to report that the tables, erroneously captioned "An International Termite Exposure Test—15th Progress Report", which appeared in PESTS in the June issue should have been the "17th Progress Report." We now shall wait until the coming year to publish the "18th Progress Report."

The termite test table below is a processed report by the Forest Products Laboratory on results of wood preservatives placed in cooperative test by the Laboratory and the Bureau of Entomology and Plant Quarantine.

The experiment was of round Southern fence posts on the Harrison Experimental Forest, Saucier, Mississippi, after about 41/2 to 9 years service.

Pest Poisons Dangerous in Hands of Inexperienced

EDITOR'S NOTE: *Items of constructive public-relations interest will appear in this column from time to time. The following is from The Wichita Falls (Texas) Record News.*

Homeowners may be endangering their own or their children's lives by permitting inexperienced persons they do not know to work on ridding premises of rats and other vermin through the use of poisonous ingredients. Yet many homeowners take that risk.

This word of caution comes from F. E. Shoop, owner of the Texas Termite Company, 1308 Fillmore, who has been in Wichita Falls for more than 40 years and a verminologist for 15 years.

Latest Methods Used

Through the National Pest Control Association and the Texas Pest Control Association, conferences of which Shoop attends each year, are presented the latest methods to adopt and the poison to use in destroying all kinds of vermin and insects.

Shoop called attention to an incident in a Texas city where a drive on rats was conducted through federal-state assistance. A child's death from the poison used resulted, Shoop reported, and he added: "Thank God, it was not a pest control operator."

When a job is completed, it's important that the customer know with whom to get in ready touch in event of further service. "Fly-by-nighters"—those who do a job, receive payment and then skip town—cost property owners plenty and Wichita Falls is not without such representatives who are "here today and gone tomorrow." . . .

Termites Detected

Shoop stated that he is now using an instrument which detects termites eating wood in and under the house and that a demonstration of its operation will gladly be given. The instrument is also used in oil field work. . . .

Condition of round southern yellow pine experimental fence posts on the Harrison Experimental Forest, Saucier, Mississippi, after about 4-1/2 years' to 9 years' service

Treated posts set late in 1936, and later. Inspected December 1946

Preservative	Posts in test[1]	Absorption of preservative[2]				Condition of posts															
		Mini-mum	Maxi-mum	Average	Standard deviation	Good		Serviceable but showing some -						Removed account of -							
								Decay		Decay and termite attack		Termite attack		Decay		Decay and termite attack		Termite attack		Total removed	
	Number	Pounds per cubic foot				Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Posts set late 1936 to February 1937																					
Boron-boric acid (50-50 mixture)	98	Salt	0.64	1.32	0.92	0.11	10	10.2	13	13.3	8	8.2	22	22.4	2	2.0	19	19.4	24	24.5	45	45.9
Beta naphthol, 5% (by weight) in oil mixture	99	Solution	5.9	10.0	6.2	1.3	21	21.2	9	9.1	19[3]	19.2	16	16.2	4	4.0	18	18.2	12	12.1	34	34.3
Celcure	96	Salt	.73	1.05	.92	.08	87	90.6	3	3.1	—	—	—	—	4	4.2	2	2.1	—	—	6	6.3
Chromated zinc chloride	99	Salt	.37	1.33	.87	.19	61	61.6	10	10.1	4[3]	4.0	11	11.1	7[3]	7.1	6	6.1	—	—	13	13.2
Coal-tar	99	Oil	1.6	19.2	6.5	2.9	74	74.8	8	8.1	9	9.1	5	5.0	2[3]	2.0	1	1.0	—	—	3	3.0
Coal-tar creosote, Grade 1	98	Oil	1.9	8.6	6.0	1.5	90	91.9	6	6.1	2	2.0	—	—	—	—	—	—	—	—	—	—
Coal-tar creosote 50%, used crankcase oil 50% (by volume)	100	Mixture[3]	1.6	14.8	5.4	2.2	95	95.0	5	5.0	—	—	—	—	—	—	—	—	—	—	—	—
Coal-tar creosote 10%, used crankcase oil 90% (by volume)	100	Mixture[3]	1.2	23.2	7.1	3.8	22	22.0	20	20.0	1	1.0	—	—	50	50.0	7	7.0	—	—	57	57.0
Crank-case oil (used)	100	Oil[3]	8.5	16.8	7.6	2.9	16	16.0	18	18.0	2	2.0	—	—	61	61.0	3	3.0	—	—	64	64.0
Lignite coal-tar creosote	98	Oil	1.1	11.6	6.3	3.2	59	60.2	11	11.2	18	18.4	2	2.0	3	3.1	4	4.1	1	1.0	8	8.2
Mercuric chloride	100	Salt	.05	.15	.09	.03	90	90.0	—	—	—	—	6	6.0	—	—	1	1.0	3	3.0	4	4.0
Ne-O-X	100	Oil	1.3	13.6	6.6	3.5	43	43.0	15	15.0	10	10.0	7	7.0	3	3.0	20[3]	20.0	2	2.0	25	25.0
Osmosar	97	Salt	—	—	.30[3]	—	80	82.5	11	11.3	2	2.1	—	—	2	2.1	2[3]	2.0	—	—	4	4.1
P.P.A. (phenyldichlorarsine) 0.8% in gas oil (by weight)	98	Solution	4.1	11.0	5.9	.9	33	33.7	11	11.2	10	10.2	32	32.7	1	1.0	6	6.1	5	5.1	12	12.2
Pentachlorophenol, 4.82% (by weight) in used crank-case oil	99	Solution	2.9	9.5	6.7	1.6	97	98.0	2	2.0	—	—	—	—	—	—	—	—	—	—	—	—
Pentachlorophenol, 5.02% (by weight) in used crank-case oil	99	Solution	3.1	11.4	6.4	1.8	95	97.0	2	2.0	—	—	—	—	1	1.0	—	—	—	—	1	1.0
Sodium bichromate	98	Salt	.59	1.14	.88	.11	39	39.8	4	4.1	7	7.1	35	35.7	1	1.0	4	4.1	8	8.2	13	13.3
Sodium chromate	93	Salt	.70	1.19	.93	.10	17	18.3	4	4.3	5	5.4	43	46.2	—	—	6	6.5	18	19.3	24	25.8
Tanalith	100	Salt	.80	.47	.35	.07	70	70.0	21	21.0	2	2.0	3	3.0	3	3.0	1	1.0	—	—	4	4.0
Tetrachlorophenol, 2.9% (by weight) in used crank-case oil	98	Solution	1.2	16.1	7.1	3.1	78	79.6	19	19.4	—	—	1	1.0	—	—	—	—	—	—	—	—
Tetrachlorophenol, 4.8% (by weight) in used crank-case oil	99	Solution	3.5	9.4	5.8	1.5	96	97.0	3	3.0	—	—	—	—	—	—	—	—	—	—	—	—
Water-gas tar	99	Oil	1.2	19.0	6.3	3.0	91	91.9	5[3]	5.1	—	—	3	3.0	—	—	—	—	—	—	—	—
Zinc chloride	100	Salt	.67	1.11	.94	.10	58	58.0	2	2.0	8	8.0	30	30.0	1	1.0	1	1.0	—	—	2	2.0
Zinc-meta-arsenite	98	Salt	.25	.54	.42	.06	96	98.0	2	2.0	—	—	—	—	—	—	—	—	—	—	—	—
Untreated posts (set February 1937)	69[4]	—	—	—	—	—	—	—	—	—	—	—	—	—	2	3.1	61	93.8	2	3.1	65	100.0
Posts set after February 1937																					
Untreated posts (set November and December 1938)	33[5]	—	—	—	—	—	—	—	—	—	—	—	—	—	11	33.3	21	63.6	1	3.1	33	100.0
$(CuO)_3(As_2O_5)_2$[6] (Set May 1941)	100	Salt	—	—	(.33 (.16	—	98	98.0	1	1.0	1	1.0	—	—	—	—	—	—	—	—	—	—
Osmoplastic-groundline treatment (Set Feb. 1941)	100	Mixture	—	—	.34[7]	—	83[8]	83.0	3	3.0	3	3.0	9	9.0	—	—	—	—	2	2.0	2	2.0

Note: All preservatives, except copper sulphate-sodium arsenate, mercuric chloride, Osmoplastic and Osmosar were applied by pressure, the oils by the Rueping process and the salts by the full cell process. Mercuric chloride was applied by steeping and Osmosar and Osmoplastic by brush. The copper sulphate-sodium arsenate was applied by the double diffusion method. Seventy percent of the posts in each group are installed in well drained soil, 20 percent are in moist soil and 10 percent are installed in swamps.

[1] Installation included 100 posts per each treatment. This number has since been reduced in some cases due to losses by fire and pilferage.

[2] Based on the 100 posts treated in each group unless otherwise indicated.

[3] Absorption values based on 97 posts.

[4] Absorption values based on 89 posts.

[5] Absorption values based on 99 posts.

[6] Deterioration in one post at faces cut in pointing it for driving.

[7] Decay and termites apparently gained access to 2 posts through faces cut in pointing them for driving.

[8] Average application.

[9] Decay and termites apparently gained access to one post through faces cut in pointing for driving.

[10] Decay at bottom of one post which appears to have been cut off in setting.

[11] Untreated posts installed during 1937 had an average life of 3.0 years, those installed during 1938 had an average life of 3.6 years - Grand average for both groups - 3.2 years.

[12] Treated by double diffusion process.

[13] Average application per post - 15 g head (3" above and 12" below the groundline)

[14] Not inspected below groundline, in order to avoid disturbing the rubber bandage.

Prepared by WHS Date 1-16-47

Approved by [illegible] Date 1-21-47

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PYRENONE NO. 20 NEW will be available for 1947 sprays. Its use will permit maintenance of the highest standards of performance and agreeableness while keeping costs at a reasonable level.

The fact that it is now possible to make sprays equal in all respects to straight pyrethrum sprays, and far superior to them in killing power and residual effect, at attractive costs cannot fail to dominate industry policies for 1947.

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Pomerantz Honored at P.E.A. Dinner

Charles Pomerantz, of the Bell Exterminating Co., was guest of honor at the annual dinner of the Professional Exterminators Association, New York, held on December 9 at the Hotel Brewster. Mr. Pomerantz, a member of the Association, is credited with discovery of the mite causing mouse mite fever (Rickettsial Pox), a newly recognized rickettsial disease. Dinner guests added up to over 90 and included, among others, also PCOs from the New Jersey Pest Control Association, several members of the faculty of Rutgers University and manufacturers' and supply house representatives.

That the guest of honor was deeply moved by the spirit of the occasion there was not much doubt. In recounting his experiences before, during and since his discovery of the mouse mite, Mr. Pomerantz ran the oratorical gamut from philosophy to prophecy . . . from poetry to paraphrase, biblical and otherwise.

He modestly disclaimed any credit for himself, gratefully attributing whatever success may have come his way to the conferences sponsored by the NPCA in cooperation with Purdue University, Massachusetts and State College and University of Montreal and the short courses held under the auspices of Rutgers and Fordham universities in conjunction with the NJPCA and the PEA, respectively.

Attending these, he insisted, not only gave him much-needed orientation but also an applicative knowledge of mites, ticks and other pests inimical to man. And, he added, above all, they fired him with the will and determination to show the world that there was far more to pest control than the mere mechanics of baiting, spraying or dusting; in short, that it was both a profession and an essential industry serving as a second line of defense of public health, to say nothing of its primary place in the conservation of vital commodities and properties. Concluding, he expressed the hope that his efforts had led to increased respect for the Industry, given it greater prestige**; and that if they had he would feel well repaid.

As a mark of its appreciation, The Association presented Mr. Pomerantz with a pocket microscope (40-60 magnification), and on the theory, no doubt, that since he had fared so well, previously, with a less powerful one, he would do infinitely better with this new one.

Joe Finneman, ubiquitous and perennial PEA president, acted (the verb is used advisedly) as emcee, sparking the festive occasion with ready wit and pungent aphorism. Donning the raiment of 'Father Time', he reeled off in rhythmic format a number of humorous epitaphs inspired by the amiable foibles of several present. (We hope to publish some of these verse in an early issue.)

Tom Mahon, in the absence of William O. Buettner, secretary, NPCA, who was away on a business trip, spoke for the Association, praising Mr. Pomerantz's achievements and claiming him as the Association's own.

In appreciation of his watchdog-like attitude over and towards PEA funds, Treasurer "Bill" Farrell was presented with a plaque. The plaque was headed "Wm. Farrell, Jr."—junior being depicted—as you've probably guessed—by a sitting bull dog. "Bill's gracious and innately friendly wife, Jacqueline, also received a gift of several lovely pieces of costume jewelry. No one could be more deserving.

***We are glad to note that Mr. Pomerantz's hopes for increased recognition and respect for the Industry are being realized, for, since the dinner, he has been invited to address students at the New York University College of Medicine on his research and findings in connection with Rickettsial Pox.* ED.

Science Uses Mouse's Squeak

New York — Counterpart to the old story about slaughter houses using everything, including the pig's squeal, is found in scientific laboratories where the mouse's squeak and the rat's tail wag are put to use. The strength of pain-relieving drugs is measured by a mouse's response to an electric shock in tests at the Wellcome Research laboratories at Tuckahoe, N. Y. The mouse is given the drug and then given 15-volt electric shocks to its tail. The number of shocks that can be given before the mouse squeaks is used to measure the strength of the drug. The rat's tail wag is used for the same purpose at the Lederle laboratories at Pearl River, N. Y. The rat's tail is placed in a groove and by means of a lens a light is focused on the tip of its tail. The length of time that elapses before the rat moves its tail gives the measure of how effective the drug is in stopping pain. The two methods were reported by an observer for the Hospital Bureau of Standards and Supplies here.—(Science Service).

DDT Up to Date

Admittedly not a "cure-all", DDT doubtless controls a wider list of pests than any previously known insecticide. Of interest to the industrial management of the world, the following pests succumb to properly compounded and appropriately applied DDT compositions:

mosquitoes	bedbugs
houseflies	lice
stable flies	ants**
blow flies	cockroaches
silverfish	brown dog ticks
filter flies	fruit flies
sand flies	clothes moths
buffalo gnats	carpet beetles
fleas	ticks**

**Certain species

In the above list it is readily apparent that certain pests affecting not only the home owner but also commercial interests may be controlled. As an individual, one is particularly sensitive to mosquitoes not only as an annoyance but also as to the possibility of their transmitting certain contagious diseases. The latter application is particularly appropriate to residents of the Southern states. The application of DDT preparations has already demonstrated that homes may be kept free from the pest as well as parks and other areas of public congregation.

In the agricultural field, the United States Department of Agriculture in March, 1946, issued recommendations for the use of DDT insecticides for the control of the following:

gypsy moth	cankerworm
elm leaf beetle	sawflies
catalpa caterpillar	evergreen bagworm
locust leaf miner	tent caterpillar
boxwood leaf miner	

Other major insects for which DDT has been recommended by various agricultural authorities include fleabettle, Colorado Potato beetle, potato psyllids, lygus bugs on sugar beets and alfalfa grown for seed, cotton fleahopper, bollworm, green peach aphid and potato aphid.

An up-to-date review of DDT would not be complete without stating that domestic facilities for production have not proved adequate to meet demand. To even those closely associated with the annual consumption of economic poisons in this country and abroad, this state of affairs had not appeared possible when they considered that potential production was rated at 3,000,000 pounds per month of technical DDT. There appears to be no reason, at the present, why the consumption of DDT should decrease in 1947. In fact there will, without doubt, be additional uses endorsed by State and Federal workers over the winter season and there might well be an even greater quantity of DDT used in 1947 than has heretofore been employed. When one considers that application, particularly in the livestock and fruit fields, has only begun, then the prospect for greater consumption in the future becomes more readily apparent.

**Information Released by Geigy Co., Inc., N. Y.*

Symphony for a Rat

To the wonderment of science, Moe was doing just as well as Joe though it wasn't planned that way. Moe and Joe, two rats, are the principals in a Red Cross dieticians' exhibition. Moe, despite a deficient diet, gained weight, ounce for ounce, with Joe. Then the secret came out. A young girl worker who "felt sorry" for Moe had been slipping choice bits into his cage.

IT PAYS TO ADVERTISE

RATS RUN FROM SKUNKS

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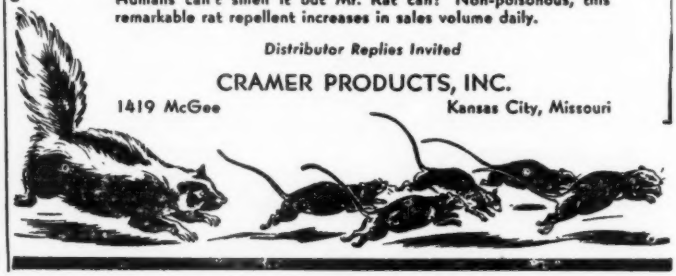

Seventh Annual Southern Pest Control Operators' Conference

January 30, 31 and February 1, 1947

Notwithstanding crowded conditions on the campus of Louisiana State University, there will be held the Seventh Annual Southern Pest Control Operators' Conference on January 30, 31, and February 1st. All of the hotels are crowded and it is urgently recommended that time of arrival be scheduled so that rooms will not be occupied until Thursday, January 30th.

Requests for reservations for rooms should be made directly to the following hotels: Heidelberg, King and Istrouma. It is suggested that if there should be difficulty to obtain reservations or if there is necessity for any arriving earlier than January 30th, communications should be sent directly to L. S. Bridges, P. O. Box No. 1121, Baton Rouge, Louisiana.

The Annual Conference this year will particularly stress rat stoppage demonstration. The registration fee is $10.00 and includes the Conference Manual and Banquet.

Subject to slight change the program is as follows:

PROGRAM
SEVENTH SOUTHERN PEST CONTROL OPERATORS' CONFERENCE

Thursday, January 30, 8:00 A. M., Registration, Room 102, Audubon Hall.

January 30—Morning and Afternoon Program
John M. Parker Auditorium
Presiding Morning, Dr. O. W. Rosewall; Afternoon, Theodore Oser

9:30 A. M. Welcome.....Fred C. Frey, Dean of University
Harry D. Wilson, Chairman Louisiana Pest Control Commission
Response.....H. O. Abel, Regional Vice-President NPCA
Sanitation Methods Employed in Texas..Ralph Marvel
With special reference to pest control.
Sanitation Methods Employed in Louisiana.....
.....Speaker to be Announced
With special reference to pest control.
PCO, The Applicator.....J. Harvey Sturgeon
11:45 A. M.-
1:00 P. M. Luncheon.....Arranged by L. S. Bridges
1:00 P. M. Value of Demonstrations of Material and Equipment .....August Balzer
Agricultural Center—
Demonstrations of Application of Insecticides and Equipment..C. E. Smith, R. F. Reece, Robert Couhig
Good Practice in Box Car Fumigation....H. T. McGill

January 30—Evening Program—7:30 P. M., State Capitol
W. E. Anderson, Presiding

Discussion of Roach Control.....C. A. Trimbos

January 31—Morning and Afternoon Program
William O. Buettner, Presiding

9:00 A. M. Bait Mixing, Poison Baits Prepared, Poison Food Feeding to Rats.....Theodore Oser
Symposium on Rodent Poisons.....
.....Herman Fellton, Leader, C. H. Ticer and Robert B. Deen
1080, Antu, Arsenic, Thallium Sulphate, Strychnine, Red Squill, Barium Carbonate.
11:45 A. M.-
1:00 P. M. Luncheon.....Arranged by L. S. Bridges
1:00 P. M. Rat Stoppage—A Field Demonstration
Orientation Lecture.....A. Blieden
Rat-Stoppage Jobs.....A. Blieden and Assistants

January 31—Evening Program—7:30 P. M.
Annual Banquet, Heidelberg Hotel
Theodore Oser, Presiding
Entertainment

February 1—Lectures and Demonstrations
Dr. J. Harvey Roberts, Presiding

9:00 A. M. Structure of a Typical Insect.....J. Harvey Roberts and Staff
Mouth Parts of Insects
Respiration in Insects
Life Histories of Insects
11:45 A. M. Conference Adjourned.

Seventh Annual Eastern Pest Control Operators' Conference

February 3, 4 and 5, 1947

The Seventh Annual Eastern Pest Control Operators' Conference will be held at Massachusetts State College, Amherst, Massachusetts, February 3, 4, and 5. Because of the crowded conditions due to large college enrollment, registration at this conference must of necessity not exceed 75 representatives. The registration fee this year is $12.50 which includes the Conference Manual and the Banquet. Registration form may be obtained from William O. Buettner, 3019 Ft. Hamilton Park, Brooklyn 18, N. Y.

If there are any desiring hotel accommodations, it is suggested that you write directly to the following hotels: The Lord Jeffery and Drake's Hotel in Amherst, Massachusetts, and Hotel Northampton in Northampton, Massachusetts.

The tentative program subject to slight changes is as follows:

PROGRAM
SEVENTH ANNUAL EASTERN PEST CONTROL OPERATORS' CONFERENCE

Sunday, February 2, 7:30-9:00 P. M.—Advance Registration, Lord Jeffery Inn.

Monday, February 3, 8:30-9:00 A. M.—Registration, Bowditch Lodge.

February 3—Morning Program—Bowditch Lodge
Dr. C. P. Alexander, Presiding

9:05 A. M. Greetings.....President Hugh P. Baker, Massachusetts State College
9:30 A. M. Keeping Up To Date In Pest Control.....
.....J. Edwin Sameth, Discussion Leader
Piperonxl Butoxide (T-105).....Dr. W. E. Dove
Hexachlorocyclohexane.....Mr. Carl W. Peterson and George R. Chamlin
(HCCH—Gammexane—666 —Benzene Hexachloride)
Toxaphene (3956).....R. J. Both
$C_{10}H_8CL_8$.....W. E. McCauley

February 3—Afternoon Program—Bowditch Lodge
Walter Dykstra, Presiding

1:30 P. M. Handling Rat Odors....Ken Cook and Wm. J. Maguire (Demonstration)
Bait Mixing Devices.....John K. Medoff and Kenneth Tompkins
Evaluation of Rat Repellents.....
(Demonstration).....W. W. Dykstra, Charles C. Scott and Luther Baungartner
Rodent Control Symposium....Ernest M. Mills, Leader
(Questions and answers on Antu, 1080, emetics, supersonics, bird control, etc.)

February 3—Evening Program—Fernald Hall
Dr. J. Harrie Burdge, Presiding

8:00 P. M. Rickettsial Pox.....Charles Pomerantz

"Colors of the Rainbow," sound film showing the use of dyes in Wildlife baits.

February 4—Laboratory Sessions—Fernald Hall
Dr. C. P. Alexander, Presiding

9:30 A. M. Laboratory Program—Dermestid Beetles.
Section 8—Identification of Dermestids on Basis of Types of Injury.....Dr. Sweetman and Department Staff

12:15 P. M. Conference Photograph—Steps, front of Fernald Hall

1:30 P. M. Section A—Classification and Morphology
.....Drs. Alexander, Smith and Department Staff
(Those taking one section in morning will enter the other section in afternoon)

3:30 P. M. Summary and Discussion..Dr. H. L. Sweetman, Leader

February 4—Evening Program—7:00 P. M.
Annual Banquet, Lord Jeffery Inn

Toastmaster .....Herbert Meyer
Guest Speaker.....President Hugh P. Baker, Massachusetts State College

February 5—Morning Program—Bowditch Lodge
D. P. McAlinden, Presiding

9:30 A. M. Termite Symposium—
"Operation M. S. C."....Robert Troup, Leader
"Termite Control 10 Years Ago and Now"
..... Neely Turner

February 5—Afternoon Program—Bowditch Lodge
Walter Dykstra, Presiding

1:30 P. M. Visit to Fish and Wildlife Service Bait Station for exhibits and demonstrations of control methods, operation of mixing equipment, bait boxes, etc.

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22 More States Offer Recommendations for 1947 Uses of New Spray Materials

References to spray-materials recommendations for pests destructive of agricultural crops, apperaing in the December, 1946, issue of AIF News from which this survey is reprinted, have been deleted. For other State-by-State survey data, see December, 1946, Pests, pp. 47-48. Ed.

Twenty-two more States have joined the State-by-State survey of new-material recommendations for 1947 and two others, have sent additional information.

The questionnaire asked: "For what uses will you recommend DDT in 1947?" This explains the preponderance of DDT mention in the replies.

It also asked "what other new materials will you recommend? What previously recommended spray schedules will be changed and what will be recommended in place thereof? On what pests where chemical control has not been practiced in the past in your State will control measures be applied this year? With what materials? Can you estimate volume? Do you expect any changes or unusual situations?

ALABAMA

J. M. Robinson, head of zoology-entomology department, plans to recommend DDT for "household use and outbuildings, livestock, barns, etc.

He anticipates "more extensive control of hornfly on cattle, and of the house fly. There was considerable control in 1946 for the first time. DDT will be used."

For uses where rotenone has been preferred but was in short supply during the war, he expects "a much more extensive use of rotenone than during the past few years."

ARIZONA

Charles T. Voorhies, economic zoologist, plans to recommend DDT "for flies (except tabanids) on livestock; and for false chinch bugs. Also for the brown dog tick."

COLORADO

George M. List, head of the entomology department, will recommend DDT for house fly, certain livestock pests, and bedbugs.

"No recommendations of other new materials are contemplated."

DELAWARE

L. A. Stearns, entomology department head, says "DDT will be recommended by us in 1947 against certain livestock pests, certain household insects and mosquitoes.

"We are not in position to make any comment concerning other new materials."

GEORGIA

Theodore L. Bissell, entomologist, expects to recommend DDT "for fly control in barns and other buildings; for treating animals against flies and fleas; for cockroaches and ants in the household."

ILLINOIS

George C. Decker, entomologist of the Illinois Natural History Survey and of the experiment station, expects to recommend DDT "for all insect pests attacking livestock except cattle grubs and screwworms; for treating farm buildings to control flies and mosquitoes; and for use in homes, food processing plants, etc., for miscellaneous pests;

Among other new materials "we will recommend 1068 for grasshoppers and household pests (particularly the German roach).

"DDT and 1068 in household sprays and fly control will reduce demand for fly sprays and old household insecticides such as fluorine."

IOWA

Carl J. Drake, State entomologist, reports that "DDT wettable powder is being used extensively as a cattle fly spray in Iowa. No DDT oil sprays are recommended for farm animals. For dairy and other barns, either wettable powder or miscible oil is satisfactory."

KENTUCKY

W. A. Price, State entomologist and entomology department head, expects the 1947 DDT recommendations to tally closely with a previous extension bulletin..

Customary recommendations are added for use in empty grain bins and corn cribs, and against flies, mosquitoes, bedbugs, fleas, ants, roaches, lice and ticks.

LOUISIANA

C. E. Smith, entomology department head, will recommend DDT for the control of "housefly, hornfly, stable fly, mosquitoes, cockroaches, lice on man, livestock and poultry; bedbugs, fleas, some species of ticks and ants."

"No complete changes of spray schedules are anticipated, but a number will be altered to include DDT.

"No pests come to mind on which some sort of chemical control has not been practiced in Louisiana in the past. However, chemical control will very probably increase considerably against almost all pests. Since DDT has proven very effective, the volume of this chemical used will doubtless be greatly increased."

MAINE

F. H. Lathrop, entomologist, sends a series of Maine extension circulars on the use of DDT for flies in dairy barns. He expects also to recommend DDT next year "for the control of houseflies and some other household pests.

"No important changes from 1946 recommendations are expected."

MARYLAND

George S. Langford, specialist in insect control, was not ready to announce 1947 recommendations until a fuller analysis of the past season's work. He commented, however, that "DDT has been used quite extensively in Maryland. Users were well pleased with the results in barn and cattle spraying, and indications are that the work will be expanded in 1947.

"In experimental research for comparative efficiency in Japanese beetle control, DDT, benzene hexachloride and an alkylated naphthalene, all were found efficient.

"Except for the disagreeable odor, several of our commercial growers preferred benzene hexachloride to DDT for Japanese beetle. I can't see that the kill was any better but the knockdown was faster.

"Except for the odor, benzene hexachloride appeared satisfactory for barn and cattle work."

MASSACHUSETTS

A. I. Bourne and W. D. Whitcomb, professors of research entomology, expect to recommend DDT for Japanese beetle and household pests.

Professor Whitcomb adds that "the greatest obstacle to more general recommendations for the use of DDT is the lack of information on the action of the Food and Drug Administration regarding the tolerance and restrictions for DDT residue on fruits and fresh vegetables."

MISSOURI

Leonard G. Haseman, chairman, department of entomology, expects to recommend DDT for house insects; for lice and blood-sucking flies of livestock.

NEW JERSEY

Bailey B. Pepper, research specialist in entomology, says:

"DDT will probably be recommended for several insects attacking ornamental plants in the greenhouse and outdoors; for fly control in animal shelters; and in poultry houses for fleas, lice and bedbugs.

NEW YORK STATE

Charles E. Palm, entomology department head, expects to recommend DDT.

"For various household insects; for fly control in dairy barns; for horn fly on cattle and wool maggot on sheep..

NORTH CAROLINA

B. B. Fulton, C. F. Smith and W. M. Kulash, of the department of zoology and entomology, expect to recommend DDT for "flies, roaches, ants and fleas."

NORTH DAKOTA

J. A. Munro, entomology department chairman, supplementing last month's report by F. Gray Butcher, extension entomologist, says DDT will be recommended in 1947 for "insects affecting livestock and the household," and he comments that "benzene hexachloride has given excellent results in our barn-spraying tests in the control of flies."

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Ton lots	31½c per lb.
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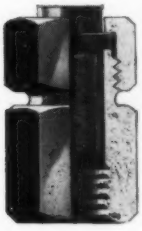

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Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

JOHN OPITZ, INC.

50-14 39th Street Long Island City 4, N. Y.

Manufacturers of Exterminating Products Since 1874

OKLAHOMA

C. F. Stiles, extension entomologist, supplementing last month's report by F. A. Fenton, entomology department head, says "DDT will be used extensively for the control of horn flies and to some extent for stable flies. Large amounts will also be used for the housefly. During the winter months a considerable amount will also be used for cattle lice. It will be used in both dips and sprays.

TEXAS

F. L. Thomas, chief of the division of entomology, says "DDT is recommended for some household insects and some species of insects affecting livestock.

"Benzene hexachloride is a promising insecticide, but since it has been used in expreiments during only one season, we do not recommend it for general use."

WASHINGTON

David H. Brannon, extension entomologist, expects to recommend DDT for control of cattle lice and flies.

WEST VIRGINIA

L. M. Peairs, entomology department head, expects to recommend DDT for barns and animals in pastures for horn flies and stable flies; and certain household insects—not roaches."

WRITE FOR THESE BOOKLETS

A complete assortment of eye protection equipment for every application is described in detail in a colorful new 8-page bulletin published by Mine Safety Appliances Company.

Included in M.S.A.'s full line of eye-protective devices are Chippers' Goggles equipped with M.S.A. Protective Lenses, Chemical Goggles for protection against dangerous chemical particles and splashes, Open frame Ful-Vue Spectacles, spectacles with side screens and leather side shields, Dust Goggles, Dreadnaut Goggles designed for protection against flying particles from any direction, Welders' Goggles with a wide choice of lense types, foundry and melters goggles, acetate spectacles, gas goggles, wire screen goggles, and specially designed goggles for workers who must also wear corrective glasses.

The new bulletin also features the M.S.A. Speedframe, a goggle mounting which eliminates troublesome band adjustment, M.S.A. Fogpruf for quick efficient cleaning of lenses, and the M.S.A. Goggle Cleaning Cabinet which contains Fogpruf and optical wiping tissues in a convenient wall mounting — designed to encourage workers to wear their goggles and to keep them clean.

A copy of the new M.S.A. bulletin on eye protective equipment (No. CE-29) can be obtained by writing direct to Mine Safety Appliances Company, Dept. P, Braddock, Thomas and Meade Sts., Pittsburgh 8, Pennsylvania.

Are you acquainted with the proper DDT insecticides to meet your insect control problems? Geigy Company, Inc., Originators of DDT Insecticides, have prepared these 8 colorful leaflets giving specific information on how, when and where to apply Geigy DDT compositions for best results. Left to right they cover control of pests attacking Forest and Shade Trees; Field Crops; Livestock; Potatoes; Truck Crops; Flowers, Shrubs, Lawns; Dairy Cattle (Barn Fly control); Fruit Trees. These free folders are available if you write Geigy Company, Inc., 89 Barclay Street, New York 8, N. Y.

Effective Control of Termites and Lyctus Beetles

Illustrated; leaflet discusses a few basic facts about subterranean termites, such as how to recognize termite attack how to control subterranean termites and prevent attacks.

Properties of Terratox Formulations also discussed. Wood Treating Chemicals, Dept. P, 5137 Southeast Ave., St. Louis 10, Mo.

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This carrier is designed and engineered to simplify the handling of all drums and barrels with embodied safety features to protect the operator.

Sullyvan Corp., Dept. P, 415 West Garvey Ave., Garvey, Calif.

INSECTICIDE CONCENTRATES

Herein discussed are pyrethrum products, fortified red squill, rotenone and DDT products, benzene hexachloride, the newest of the synthetic insecticides.

R. J. PRENTISS & CO., Inc., Dept. P, 110 William Street, New York 7, N. Y.

FORTIFIED RED SQUILL

Leaflet discusses value of fortified red squill powder or liquid concentrate in the control of rodents. Some constructive suggestions on how to mix effective baits are also included.

R. J. PRENTISS & CO., Inc., Dept. P, 110 William Street, New York 7, N. Y.

COCKROACH CONCENTRATE

Described is a new oil-base cockroach formula which has been found by authoritative tests, it is stated, to be 3 to 10 times more powerful than DDT. This insecticide combines immediate effectiveness, residual toxicity, safety and economy, it is stated. Useful for many other common insect pests. In space and surface sprays it is effective against Paroah's ant, carpenter ants, lawn ants, Oriental roaches, flies, mosquitoes, clothes moths, carpet beetles, bedbugs, etc. Space and residual spray formulations listed.

R. J. PRENTISS & CO., Inc., Dept. P, 110 William Street, New York 7, N. Y.

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

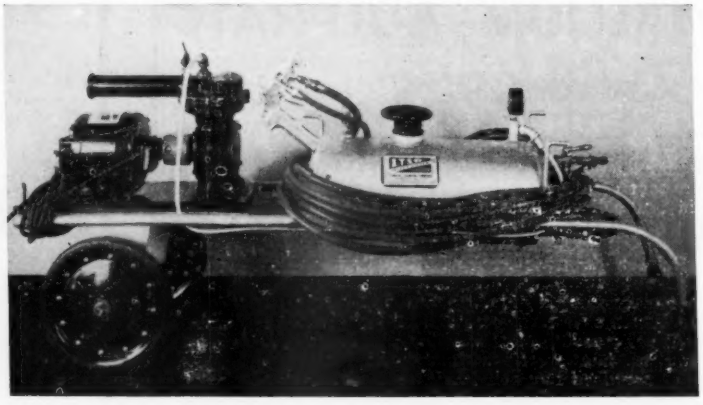
Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

The C. A. Griggs Exterminating Company of 5 South Bellevieu Place, Indianapolis, Ind., a company with a good reputation, wants a PCO with some sales experience that can prove a clean honest character, starting salary $60 per week and commissions.

Will sell old established, well equipped, exterminating and termite business, located in mid-western city, 400,000 population. Excellent opportunity for right person. Reason —sickness. Pests — Box 16.

For sale — Well established pest control business. Located in California. Nets $10,000 a year. Price $25,000, including $15,000 inventory, trucks & equipment. Pests, Box 9.

The New *ITSO* Power Sprayer



Pest Control Operators!

The new penetrator-type ITSO power sprayer, now available to pest control operators, is the only one of its kind on the market! Ideal for use in warehouses and other large areas requiring quick coverage. The needle-nozzle feature insures penetrating action, especially effective for termite treatment. Investigate now!

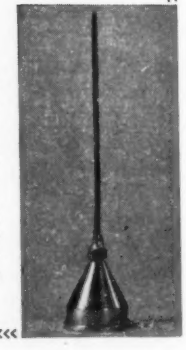
For Full Particulars Write

CAPITOL CHEMICAL COMPANY

1050 30th Street, N. W. Washington, D. C.

NEEDLE NOZZLE

Used with the Penetrator-type ITSO Power Sprayer, the Needle-Nozzle conducts insecticide into minute crevices, into furniture seams, any place where insect pests live and breed.



Exterminator supplies in BULK. Can be purchased in any amount, one can, single pounds, etc. Small orders a specialty. Low prices.

LENZ

— **Red Squill Rat Paste** (for making fresh baits on the job)
— **Red Squill Prepared Bait** (3 different flavors)
— **Antu Prepared Bait** (3 different flavors)
— **Antu Dusting Powder** (to use in runways)
— **Antu Floating Powder** (to use on water for rats and mice)
— **Moth Spray Concentrate** (one pint makes a gallon)
— **Insect Powder** (a scattering, dusting powder for roaches, bedbugs, silverfish)
— **Weed Killer** (a good summer item. Spray lawns to kill dandelions, plantain and other broad leaf weeds without killing the grass.

Write to us for circular on these items.

LENZ LABORATORY
Sycamore, Illinois

FOR SCIENTIFIC PERFECTION and PROVEN PERFORMANCE

MM&R ESSENTIAL OILS
Controlled by MM&R laboratories for highest quality. A long list of MM&R Essential Oil *Replacements* simulate the natural oils with remarkable fidelity.

MM&R PERFUME OILS
A complete range for every purpose and in various price ranges. Compound perfumes prepared to meet individual requirements.

MM&R NEUTRALIZERS
Tremendous covering power lasting effectiveness and exceptional economy

Write for Further Information and Complete Catalog

MAGNUS, MABEE & REYNARD, INC.
SINCE 1895 ... ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS
10 DESBROSSES STREET, NEW YORK 13, N. Y. • 221 NORTH LASALLE STREET, CHICAGO 1, ILL.
Los Angeles: Braun Corp. • Seattle, Portland, Spokane: Van Waters and Rogers, Inc.
San Francisco: Braun-Knecht-Heimann Co. • Canada: Richardson Agencies, Ltd., Toronto

NOTHING LIKE IT

How to be more forceful in selling yourself to the public . . . .
How to see yourself in action . . . . . .
How to dramatize your abilities.

How to be at ease when speaking . . .

Whether you are a public speaker, businessman or salesman, a book that will develop an effective speech technique—Personality—Confidence—Poise. A book for every person who desires to develop these outstanding qualities.

READ

What others have to say about the book.

". . . The book fills a niche which has long been empty for public speakers."

R. E. Crawford,
Field Representative, "Our Times."
Public Lecturer.
Nashville, Tenn.

". . . Your book is a most unusual one and should prove of great interest to all who wish to improve their performance as public speakers. An important and valuable feature of the book is the generous use of photographs to illustrate what a speaker should and should not do if he wishes to attain maximum effectiveness when addressing public meetings."
Dr. C. R. Twinn, Dept. of Agricultural,
Ottawa, Canada

". . . You had in mind the busy student or business man, who in this streamlined age does not have time to wade through voluminous paragraphs of detailed instruction on a given subject. You have accomplished wonders in brevity, thus making your text book more valuable because of its conciseness. In all my reading, I have never yet found in any library or book store covering the subject in the practical way in which you have presented it. The book 'Natural Gestures & Postures In Speech" fills a particular niche long neglected by writers and instructors on this important feature of education."

J. H. MacEachern,
Secretary, American Temperance Society, State of Mo.

PRICE $3.85

Natural Gesture & Posture Ass'n.
1200 Oak St. Room 201 Kansas City 6, Mo.

—Calendar of Meetings—

Southern PCO (7th Annual Conference), Louisiana State University, Baton Rouge, La., January 30-31, February 1, 1947.

Eastern PCO (7th Annual Conference), Mass. State College, Amherst, Mass., February 3-4-5, 1947.

Pennsylvania State PCO (1st Annual Conference), State College, Penn., February 3-4-5, 1947.

California PCO Educational Conference, College of Agriculture, University of California, Berkeley, Calif., February 10th to 12th, 1947.

Western PCO Annual Conference February 13, 14, 15, 1947. Mission Inn, Riverside, Calif.

Canadian PCO (5th Annual Conference), University of Montreal, Montreal, Canada, February 17-18-19, 1947.

Purdue PCO (11th Annual Conference), Purdue University, Lafayette, Indiana, April 7-8-9-10-11, 1947.

WHAT'S NEW IN PEST CONTROL-PERSONALS

The General Pest Control Service Co., formerly located in Beverly Hills, California, has moved into their new office and plant, 2015 Pontius Ave., Los Angeles. Best wishes.

Arch Payne

R. J. Prentiss & Co., Inc., prominent manufacturer of Insecticide Concentrates, is represented in the States of Texas, Oklahoma, Arkansas and Louisiana by Arch Payne with headquarters in the Hagar Building, 1708½ Commerce Street, Dallas, Texas.

Mr. Payne has been intimately associated with major processing, oil and chemical organizations in an executive capacity since 1919. He has had close contact with these industries in their technical and merchandising problems and has an unusual background of field experience.

Born in Liverpool, Mr. Payne attended schools in England and the United States, leaving the University of South Dakota to join the U. S. Army during the first World War. His residence is a 20-acre farm-ranch in Arlington, Texas.

F. E. Shoop

F. E. Shoop, operator of the Texas Termite Co., Wichita Falls, Texas, and Mrs. Shoop were married on November 18 last; for the second time to each other. Congratulations and all kind wishes! Attending the Christmas family reunion was a houseful, consisting of four of the Shoop children, three husbands and one grandson.

Powell Increases Antu Production

A fifty per cent rise in the production of Antu—the new rodenticide, Alpha Naphthyl Thiourea—was scheduled for December at the plant of John Powell & Co., Inc., according to W. J. Haude, sales manager, who has just completed arrangements for the increased output.

The Powell Company, one of the major producers of Antu, has been able to secure raw materials for the increased production, he added. "As far as capacity of our plant is concerned," he said, "there is no limit to what we can produce."

Antu, a development of Johns Hopkins research under the Office of Scientific and Research Development, is a specific poison for the Norway Rat which constitutes 98% of the U. S. rat population of 150,000,000. It can be used in baits, on animal drinking cups or as a tracking poison.

The Powell product is sold either in 100% concentrated form or as a 20% dust and is for manufacturing purposes only.

Manufacturing Chemists Association

The Manufacturing Chemists' Association announces the publication of Chemical Safety Data Sheet SD-6 on Paraformaldehyde; the sixth in the series of chemical product safety manuals being prepared by them. Designed for supervisory staffs and management, the manuals concisely present essential information for the safe handling and use of chemical products.

The Paraformaldehyde manual gives the important physical and chemical properties of this product; usual shipping containers and methods for their unloading and emptying; container storing and handling; requirements for caution labels; personal protective equipment; medical controls and first aid. Medical information is prepared by the Medical Advisory Committee of qualified physicians and toxicologists.

Copies of the Chemical Safety Data Sheet on Faraformaldehyde may be procured at 15 cents per copy from the Manufacturing Chemists' Association, 608 Woodward Bldg., Washington 5, D.C. Send remittance with orders.

Barnett's Visit Pests

Richard Barnett and his wife Helen, of Barnett's Pest Control, Dayton, Ohio, stopped over in Kansas City to visit Pests.

With "Ye Ed" and Oscar Schaffer and families as hostesses, the Barnetts had one grand and enjoyable time. They enjoyed themselves so much that they decided to spend a week.

On their way home from the recent NPCA Convention, they are visiting various places of interest as well as many PCO's. They will be home within two weeks.

Come again Dick and Helen. We enjoyed having you with us.

Mrs. Burdge, Wife of Maine PCO, Decorates Own Home with Murals

It all started sixteen years ago, when unable to find a wall paper suitable for a newly purchased colonial home, Mrs. J. Harrie Burdge, wife of a Raymond, Me., PCO, who, incidentally, is NPCA's sole member from that state, turned to her amateur talents as an artist.

The result is four rooms and an entrance hall covered with unusual and interesting murals of Maine landscapes, according to a story in the November issue of "The Portland (Me.) Press Herald," which not only goes to some length to describe her lovely home but also depicts two 5" x 3 1-3" views of the murals.

Her murals range from a sepia-toned landscape of the forest primeval along the walls of her dining room, to a winter scene of snow-clad hills covering one side of the living room.

Mrs. Burdge has never taken an art lesson in her life, though her ancestry reveals a family of prominent artists. Her grandfather, for instance, was court artist for Friedrich Wilhelm IV of Germany and a collection of architectural designs and mosaics by her father, the late Otto P. Gaertner, rests in the Library of Congress.

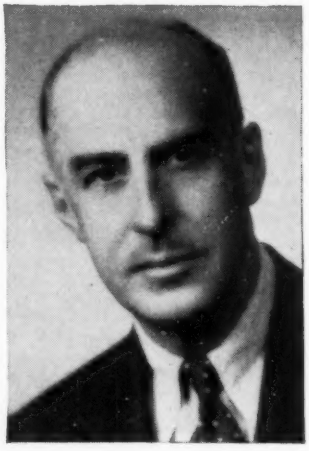
Not content with her landscape painting, Mrs. Burdge also turns out a myriad of miniature wood carvings, in the form of parrots and flower baskets, for use as curtain pulls which she presents to friends as Christmas gifts.

Although modestly proud of her artistic talent, Mrs. Burdge shares with her husband an equal pride in the accomplishments of their daughters, Carol and Nikki, now attending George Washington University.

Overheard at New Orleans Convention

Running into SHOOP — that is F. E. Shoop, of Wichita Falls, Texas — for the first time in a couple of years, a PCO friend cracked: "Looks like you've put on a few pounds 'round the midriff." "Yop, sure have," replied Shoopy, adding "That's my Milwaukee tumor."

New President of Velsicol Corporation



F. P. Schneider was elected president and general manager of the Velsicol Corporation at a special meeting of the board of directors. He succeeds Julius Hyman, executive vice-president, who recently resigned.

Mr. Schneider has been secretary and treasurer of the Velsicol Corporation since its founding in 1931. Previously he had been prominent in the paper manufacturing and oil refining fields.

The new president's plans are to expand the manufacturing and production facilities of Velsicol to handle the increased demands for Velsicol's coresin core oils, synthetic resins, aromatic solvents, and insect toxicant solvents — and the sensationally new insect toxicant, 1068.

Firm of Julius Hyman & Co. Organized

Announcement is made of the organization of Julius Hyman & Company. The company will engage in the manufacture and sale of chemical specialties and in fundamental chemical research. Its headquarters are in Denver, Colorado.

An Eastern Sales Office has been established at 11 West 42nd Street, New York City with Mr. J. Newton Hall and Mr. Dixon C. Van Winkle in charge.

Dr. Julius Hyman, the President, is the insect toxicant $C_{10}H_6Cl_8$, which has been insect toxicant $_{10}H_6Cl_8$, which has been found effective in the control of various species of institutional, veterinary and agricultural insects. Large scale production of this compound under the trade name Octa-Klor is promised within 60 days.

Dr. Hyman was instrumental in forming Velsicol Corporation in 1931, and he has associated with him in the new company a group of well known scientists and other key personnel who have worked with him for a number of years. Among these are the entomologists, Dr. C. C. Compton and Mr. W. E. McCauley.

Mr. J. Newton Hall has been named Sales Manager of the company. Mr. Hall has recently resigned from the Velsicol Corporation where he was manager of the New York Sales Office.

Mr. W. E. McCauley has become associated with the company as entomologist.. Mr. McCauley was entomologist with Velsicol Corporation since 1941 except for the

interval of the war when he served as Captain in the Sanitary Corps in the South Pacific.

Lloyd M. Joshel has been appointed as general purchasing agent. Dr. Joshel received his B. S. degree from the University of Illinois and his Ph. D. from Ohio State University, and conducted research at Harvard University under the fellowship from the Finney-Howell Foundation, and subsequently was a research chemist for the United States Department of Agriculture.

H. Sherwood Shinn

Mr. H. Sherwood Shinn heads Sprayer Division, Lofstrand Company, Silver Spring, Md. With a successful public utility operating and appliance merchandising background, Mr. Shinn leaves (after 4 years) the Research and Development Division, Office Chief of Engineers. While with the Engineers Mr. Shinn directed the development of the 3 gal. knapsack Stainless Steel Insecticide Sprayer used by the Army throughout the world, during the war.

The Lofstrand Company, manufacturers of quality glass washers for 16 years, after manufacturing this sprayer for the Army, have offered it during the past year to the public with a wide general acceptance, particularly in the dairy, pest control, meat, baking and farming industries.

With the coming of Mr. Shinn, the Lofstrand Company will offer a complete line of high quality sprayers and dusters and will set up a large distributor and dealer organization throughout the world.

Speaking of his new duties, Mr. Shinn said "we will not enter the competitive price range of sprayers, but rather will strive through the use of stainless steel and brass to provide each customer with the last sprayer he will ever need to buy."

Mr. Shinn is a graduate Electrical Engineer, holding two degrees from West Virginia University.

Necrology

CONDOLENCES: BILLY HOGAN, JR., 17-year-old son of William Hogan, advertising manager and co-publisher of "Pest Control and Sanitation" and operator of the U. S. Termite Control Corporation, Ltd., Pasadena, Calif., and Mrs. Hogan, was killed in an automobile accident November 26. Billy's parents had returned to their home in S. Pasadena only the night before after a trip which included the New Orleans convention and a visit down East.

Shoop Injures Head

In the process of putting poisoned rat bait underneath a building three feet high, and startled by a rat diving for a near-by hole, F. E. Shoop, operator of the Texas Termite Co., Wichita Falls, Texas, lifted his head rather suddenly and banged it very

RAT CONTROL

Is 5 times more effective with LARVACIDE

1. COMPLETE KILL OF RATS—*No* rat is safe from Larvacide in a reasonably tight building because Larvacide goes after rats wherever they may be. No traps to set, no baits to test. Larvacide kills overnight!

2. NO CHARGES NUISANCE—Larvacide gasses rats out of retreats. They die on the open floor to be swept up.

3. NO EXPENSIVE APPLICATORS—Simply pour Larvacide on a few burlap bags strategically placed according to directions—or use a sprayer if convenient. No muss, no bait mixing, no fuss.

4. ECONOMICAL TO USE—As little as 2-2½ lbs. of Larvacide per 1,000 sq. ft. of floor area is all you need to control rodents. Volatilizes quickly.

5. LESS DANGER TO HUMANS—Larvacide evaporates into a tear gas. You get plenty of warning before Larvacide can harm you.

PCO's

Larvacide—in handy 1 lb. size—makes a perfect fumigant to carry wherever you go. A few cans in the back of your car or truck and you are ready for any unexpected small fumigations job—anywhere, anytime. No bulky equipment to carry—no chemicals to mix. The Larvacide can opens easily with any ordinary can opener.

Larvacide, tear gas fumigant, comes in handy 1 lb. dispenser bottles, each in sealed can, 12 to wooden case, or in cylinders of 25, 50, and 180 lbs. Trade discount for 3 cases, or 100 lbs. in cylinders, or more. Write for interesting, descriptive folder giving uses, dosages and many pertinent facts about this effective modern fumigant.

ISCO

Innis, Speiden & Co.

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BOSTON CHICAGO CINCINNATI CLEVELAND OMAHA PHILADELPHIA

hard against the floor joist. He didn't pay too much attention to the bump at first, but a day later there was a lump the size of an apple on his forehead, sending him to the hospital for six days where he was treated with sulfa tablets and penicillin shots netherwise. We are glad to report Shoopy's fully recovered now. And that being the case, we are sure he won't think us unsympathetic if we ask whether the doctor knew one end of Shoopy from the other, since we never thought where the penicillin was injected was the seat of Shoopy's intelligence. . . . P. S. Unkindest bump of all: the rat got away.

Shaff Expands Plant Facilities; Adds to Staff

Shaff Laboratories, Inc., announces expansion of its manufacturing facilities by the addition of new and improved equipment and the incorporation of a systematic, scientific daily testing procedure for its products.

Norman Mitlin, who received his Bachelor of Science Degree in Biology from New York University and former proprietor of the Superior Exterminating Co., has joined the corporation, bringing to it a practical knowledge of the problems of the PCO, as well as the scientific "know how."

The corporation has also retained the services of Lucille Liston, a research chemist and graduate of West Virginia University. Formerly with Good Housekeeping Institute of New York and Lever Brothers of Baltimore, Maryland, Miss Liston will supervise the testing of all Shaff Laboratories, Inc., products.

Shaff Laboratories, Inc., has been making Strychnine-Impregnated Canary Seed and now have added Antu Paste and Powder to their line along with such items as a liquid Red Squill for rats, Anti-Mildew Compound, 2-4 D Weed Caps, Insect Repellent, etc.

Shaff Laboratories, Inc., plans to continue to sell the PCO a standardized and tested line of Rodenticides.

If anyone feels that men who engage in the busines of killing insects and other pests are hard hearted, let him consider the case of F. G. Fahrbach of Pelham Manor, N. Y. who recently resigned from a position of constable to return to his business as an exterminator. The reason for the change was reportedly Mr. Fahrbach's reluctance to act in the role of evicting families during the curent housing shortage. The last straw seems to have been regarding the eviction of a widow and her two children who had no other place to live.

—From Agr. Chemicals

Termite Operators Fined

W. R. Mills and Clifford Hodge, operating as the Mid-West Termite Control Company, Memphis, were fined $150 and $50, respectively, in municipal court at Camden on October 18, for engaging in pest control work without a state license.

The men were apparently operating a racket, in some cases representing that termites were present in a house when they were not, and charging any price they could talk the property owner into paying.

When informed of their activities the PLANT BOARD immediately wired officers in South Arkansas, requesting their arrest, and within an hour they were in the custody of Camden Police Chief G. B. Cole.

All commercial pest control operators must secure a license from the PLANT BOARD under provisions of Act 394 of 1939. License is not issued unless the applicant can demonstrate his proficiency. The PLANT BOARD checks jobs at random from time to time and may cancel an operator's license should he be found using improper methods or making misrepresentations for the purpose of securing business.

Rohm & Haas

The Rohm & Hass Company of Philadelphia, Pa., announces today the acquisition of about 500 acres of land on the Houston Ship Channel, Deer Park, Texas, for use as a plant site. The company is planning to manufacture chemical products at its new location. Construction of the plant is expected to get underway early in 1947. The Rohm & Haas Company operates plants at Bristol and Philadelphia, Pa., and at Knoxville, Tenn., where it manufactures chemicals principally for the leather, textile, insecticide and plastics industries.

Fuller Explanation Dept.

Dr. Yeager says scabies among squirrels is not as prevalent in wild populations. It is more common in cities and suburbs due to the fact that the population of squirrels is very heavy and because the animals also develop scabies.

—From the Chicago Daily Tribune.

The British Broadcasting Corporation, which has always shown a ponderous interest in animal noises, recently broadcast the sounds of animals in the London zoo. At the conclusion of its zoo experiment, the B. B. C. broadcast the sound, greatly amplified, of a moth gnawing its way through a dinner jacket. According to "The London Observer," this operation sounded like a cross between crunching leaves and rippling water. It should be a natural for a DDT singing commercial.

Packaged Wasps

Several thousand packaged wasps were recently flown to Victoria, B. C., on a Trans-Canada Air Lines passenger plane. They were brought in to combat the sawfly. The wasps, which are of a special kind known as "sturnia," or parasite wasps, lay eggs in the larva of the sawfly. Sawflies are threatening some lush stands of timber in the Queen Charlotte Islands, off the British Columbia mainland. The hemlock looper has already attacked the forests, and, when the sawfly threatened to join forces with it, Canadian government authorities acted to prevent devastation much worse than that caused by forest fires.

Mouse and Lady

A busy little field mouse, anxious to return to his chores among farm products, was cited as the cause of a highway accident by the National Safety Council. Somehow the mouse was locked in a car with a woman driver. When she saw the mouse, she got excited and drove into a telegraph pole. The mouse returned to duty, the driver went to the hospital.

Snap

The most reckless barn rats on earth are found in the basement of the largest manufacturing building in Lititz, Pennsylvania. They are trespassing on the property of the Animal Trap Company of America, world's biggest producer of traps, states an article entitled, "Snap."

The trapping industry aggressively presents itself as the defender of mankind. Atco's Harry Vancleve, former Pennsylvania state fish-and-game expert, says that without trapping control, the animal kingdom would gnaw away civilization in two years. Cities would see a race between pestilence and starvation; farms would see stripped fields and empty poultry and livestock buildings. As most of this trouble would come from rodents — animals having collarbones, no toenails and no canine teeth, but magnificent incisors. The smartest, hardest-to-trap is easily the rat; he's much more cunning than the vaunted fox. . . .

Bergen Evans of the Dept. of English, Northwestern University, in an article in the N. Y. Times, explodes the belief that the ant stores up food for the winter and the grasshopper is an improvident beggar. Declares Mr. Evans: "Aesop upholds this fallacy at one end of time and Walt Disney at the other. But it is still a fallacy. Most ants live on food that could not be stored and are torpid through the winter. A grasshopper wouldn't eat an ant's food if you gave it to him and certainly wouldn't beg for it. For the grasshopper is an industrious creature who gets his own food by boring strenuously with his rostrum for sap. And he is far from carefree. His life has many burdens, of which not the least are the thieving ants who crawl between his legs and steal the fruits of his labor!"

Pennsalt of Washington Opens Portland Sales Office

A new general district sales office of the Pennsylvania Salt Manufacturing Company of Washington is now located at 6400 N. W. Front Street, Portland, Oregon.

The office, located at the Company's Portland chemical manufacturing plant, is handling Pennsalt's line of chemicals for industry, chemical specialties and agricultural chemicals.

LeRoy M. Shaneman is district sales manager in charge of the new office. The Pennsylvania Salt Manufacturing Company of Washington is a subsidiary of the Pennsylvania Salt Manufacturing Company of Philadelphia.

Licensing Pest Control Operators

Purpose: to protect the public against fraudulent and incompetent termite operators, spray operators, household pests exterminators, and tree surgeons. Thirty-six pest control operators were licensed in 1945 and sixty-one in 1946, and periodical checks were made on their work to see that it was being done properly. Included were 360 termite jobs (about one-fourth of all termite jobs). A number of these were found defective, and operators were required to re-treat. In 1946, licenses were refused 15 applicants who were unable to show that they were competent and qualified, and a lesser number in 1945. Four termite men, operating fraudulently and without a license were arrested and fined on evidence furnished by the PLANT BOARD. License of one termite operator was withdrawn. and licenses of two spray operators and tree surgeons were not renewed, when their work was found to be unsatisfactory." Bulletin: Little Rock, Ark.

DDT and the Insect Problem

by James C. Leary, Pres. Nat'l Assn. of Science Writers; Willian I. Fishbein, Epidemiologist; and Lawrence C. Slater

DDT and the insect problem is a new book just off the press. This volume is a complete and up-to-date facts about development, applications and effectiveness of today's No. 1 insect killer—DDT.

The book covers crop protection, animal husbandry and elimination of household insects, destruction of garden pests, etc., pointing out the effect of DDT on various types of insects.

Price $2.50 plus 15c postage.

LOCAL ORGANIZATION NEWS

California PCO Educational Conference

The College of Agriculture, University of California, is offering an educational conference open to all pest control operators.

The Division of Entomology and Parasitology in charge of the conference has appointed a committee from the industry to assist in routine arrangements for the conference. This committee is composed of V. H. Montgomery, chairman, E. O. Corson, Wayne Davis, C. C. Delk, O. W. Dickens, R. V. Hanneberg, S. S. Heaton, Ernest Mills and D. C. Tracy.

The conference will be held in Agriculture Hall, on Berkeley Campus of the University, Berkeley, California, February 10-12, 1947.

Pennsylvania State College PC Conference

Modern methods of battling man's age-old enemies—insects and rodents, will feature the first Pest Control Conference ever conducted at the Pennsylvania State College, scheduled for February 3 to 5, 1947. These newer scientific developments, including chemicals and other devices, will be demonstrated, discussed and explained solely for those pest control operators located in Pennsylvania.

Although considerable interest has been shown among operators and exterminators in the Conference, officials of the college have restricted the conference to Pennsylvanians. This was made necessary by the existing housing and feeding facilities of the community, already taxed by the largest student enrollment ever listed at Penn State.

Dr. Edward H. Dusham, head of the department of zoology and entomology, and Dr. D. E. H. Frear, of the agricultural biochemistry staff, have been named co-chairmen of the committee preparing the program for the three days. Registration will begin at 10 a.m., Monday (Feb. 3) at the Nittany Lion Hotel, at the edge of the campus. Sessions will begin that afternoon in the School of Agriculture on the campus.

The entire first session will be devoted to a study of insect identification, in charge of Dr. S. W. Frost and Dr. Vernon R. Haber, entomology professors. This study will include the common and uncommon household insects, their life cycles and habits, and a visit to the laboratories to emphasize definite and accurate identification of insects and other pests. A nationally prominent leader in the field of pest control is being secured as guest speaker for the banquet planned for Monday evening.

Rodent control will occupy the Tuesday morning session. To secure the most authoritative information on this subject, the committee has secured Dr. Ernest M. Mills, of the division of rodent control for the United States Fish and Wildlife Service to lead the discussion on rodent control. Dr. Mills is located at the Rutgers University laboratory, and will explain the newer methods and materials now available for rodent control, as well as the hazards and benefits involved in their use.

For the Tuesday afternoon session, specialists of the Pennsylvania Agricultural Extension Service will join with research workers of the experiment station in demonstrating, as well as explaining many of the newer insecticides. Practical aspects of the new chemicals will be emphasized. Tuesday evening's program will include a series of educational movies on pest control subjects, and a period has been set aside for informal recreational activities.

Because this will mark the first time that pest control operators from all parts of Pennsylvania will join in a common program, the entire Friday morning session has been scheduled for a business meeting, at which those matters of interest only to operators can be considered.

Further details on the conference program can be obtained by writing directly to either Dr. E. H. Dusham or Dr. D. E. H. Frear, at the School of Agriculture, the Pennsylvania State College, State College, Pa. A registration fee of $10 is listed for the conference.

NEPCA

December 20, 1946.

The honorable Edward M. Rowe, Senator from the second Middlesex district, was the speaker at the annual meeting of the NEPCA at the Hotel Lenox, Boston, December 18, 1946.

From his wealth of legislative experience Mr. Rowe told us much which will be of value to us in plotting our proposed enabling act into law. Senator Rowe warned us of the probable opposition of "special interests". He gave us many examples of such opposition to similar bills with which he has dealt in the past.

He promised us that passage of such legislation requires work, patience, and perseverance. He recommended that we try to secure public support and that we contact each and every member of the committees through which the bill must pass.

Three new firms were added to our growing list of Applied Membership. They are John Powell & Co., Inc., Lowell Manufacturing Co., and the Monsanto Chemical Co.

A report was given by the committee on the proposed combined meeting of our group and the Connecticut Pest Control Association. Both Providence and Springfield operators have been approached to act as hosts for the meeting. No replies have been received from Springfield. Leonard Goldman of Providence has kindly offered to do the necessary work in preparing for the meeting in his city. The matter was tabled until the January meeting.

A letter was read from our friend J. Harrie Burdge. In it he regretted not being able to attend due to illness in the family. He sent his best wishes to the group in the form of a Christmas card to each attending.

The Secretary also read a letter from Charles W. Renn formerly of the Massachusetts Department of Public Health and now with Johns Hopkins University. Charlie extended his best wishes for the holiday season.

The President, Lester West, appointed the following auditing committee who are to report at the next meeting: Morris Schwartz, chairman, C. A. Chafe, and A. J. McA'Nulty.

Bart Eldredge proposed that we make a bid for the 1950 convention of the National Pest Control Association. Your secretary was instructed to prepare a letter to be sent to Bill Buettner.

Martin Nugent, Jr. entertained us with his extraordinary skill with cards. He baffled us with his ability to name the card when it seemed impossible that he could have seen it. Even George Elliott who forgot the name of the card which he had looked at only two minutes before, couldn't louse up the act.

The following officers were elected for the ensuing year, 1947: President, Lester M. West; Vice-President, Cyril A. Chafe; Secretary. Kenneth N. Cook; Treasurer, Bartlett W. Eldredge.

The meeting adjourned at 11:00 P. M.

Submitted by Kenneth N. Cook. Secy.

Those attending meeting of NEPCA, Hotel Lenox, December 20, 1946:

Joseph F. Follomon, Rose Exterminator Co., Boston.

Robert M. Borg, Ossipee, N. H.

George E. Dyar, Rose Exterminator Co., Hartford.

Grace E. Dyar, Rose Exterminator Co., Hartford.

Mark Weintraub, Astor Exterminating Co., Boston.

Morris Schwartz, State Exterminating Co., Boston.

F. E. Bohman, Birchard System, Hartford.

Lester A. Bureau, A.B.C. Exterminating Co., New Haven.

B. W. Eldredge, Waltham Chemical Co., Waltham.

Kenneth N. Cook, Ransford Insecticide Co., Worcester.

Lester M. West, Rose Exterminator Co., Boston.

George R. Elliott, Ransford Insecticide Co., Worcester.

M. A. Nugent, Waltham Chemical Co., Waltham.

L. Y. Goldman, N. E. Pest Control Co., Providence, R. I.

George Ford, Griggs & Browne Co., Worcester.

J. H. Hoeffler, American Cyanamid Co., New York.

Peter DeDilva, Bay State Pest Control, Lawrence.

A. J. McA'Nulty, A.A.A. Exterminators, Boston.

R. M. Houghton, Safety Fumigant Co., Boston.

C. W. Houghton, Safety Fumigant Co., Boston.

C. J. Havkley, Mattapan Insecticide Co., Boston.

W. J. Mugford, Mattapan Insecticide Co., Boston.

S. H. Morrison, Liberty Laboratories, Boston.

W. D. Starbird, Puritan Specialty Co., Cambridge.

Joseph Messina, Cambridge Exterminating. Cambridge.

Harry L. Bain, N. E. Ext. & Fum. Co., Lowell.

A. Bain, N. E. Ext. & Fum. Co., Lowell.

D. F. Mason, Mason Exterminating, West Haven.

St. Louis Pest Control Association

A special meeting of the St. Louis PC Association was held Saturday evening December 14th so as to take advantage of six hours stop-over which Prof. J. J. Davis and William O. Buettner had enroute to attend the meetings in Dallas, Texas.

Principal discussion was on the Rodent Control Program that is being organized in St. Louis. The PCO's of St. Louis recognized the importance of cooperation and with the assistance of the Health Department it is expected that a constructive program will become effective. A meeting

further with Health Department Officials will outline ways and means to work for the same objective. Essentially the city officials will conduct an intensive program of inspection, enforcement and education to be followed by consistent service by PCO's including sanitation efforts, rat proofing and control.

Other subjects discussed included new chemicals, business problems and the Program of the Annual Purdue PCO Conference which this year will include actual termite jobs that will be done.

Among those present were:
Gerald Clem, Rose Exterminator Co.
Henry Sherman, Charles Denny Co.
Thos. C. Raley, Getz Exterminators, Inc.
Charles Denny, Charles Denny Co.
Joe Shafer, Shafer Pest Control Service.
J. O. Millspaugh, Millspaugh Chemical Co.
Roy McCullough, Modern Fumigating Co.
Arthur Ochs, Antimite Termite Proofing Co.
Charles Maly, Maly Bros. Termite Control
Prof. J. J. Davis, Purdue University, Lafayette, Ind.
Wm. O. Buettner, Secretary, National PC Assn.

Missouri PCO Association

Another milestone was reached when the Missouri PCO Association held its third meeting at Hotel Daniel Boone, Columbia, Mo., November 30.

The meeting was climaxed by the formation of the association, the adoption of the constitution and by-laws and the election of new officers. A. L. Link, Paramount Co., Kansas City, presided as chairman. Dr. L. Haseman of the University of Missouri encouraged the association to strive for the erection of a museum building on the University Campus for exhibiting specimens that would be of interest to the association; he also stated if desired, there would be available a two-year course to help train pest-control operators.

The Association plans to hold pest control conference meetings in the future. An educational and program committee was appointed to study for further discussion things to be brought in future meetings: developments in chemicals, methods, rodent and pest control problems.

It is of vast significance to all PCO's to realize the need of a State Association because of all-time change, in these days of the transition period. New problems have come, incident to reconversion; new chemicals and materials now appear on the market.

As has been stated before in these columns, it is of apocalyptic importance (if this adjective has to be used to describe the full significance) to have our profession united and solidly organized.

In order to keep abreast of the rapid development of our ever-growing industry, and to become a powerful industry, state associations must be organized. The Missouri PCO Association is bound to exercise an important influence on decisions and policies that arise from time to time. Pest Control Operators of Kansas City are looking forward to having the NPCA Convention with them, in the near future.

The following officers were elected: A. L. Linck, Paramount Fumigating Co., Kansas City, president; Charles Denny, Charles Denny Co., Webster, Mo., vice-president; Reynold Schuyler, Termite Exterminating Co., Kansas City, secretary-treasurer.

Those who attended the meeting were:
P. H. Burnett, Getz Exterminators, Inc., St. Louis, Mo.
Charles Denny, Charles Denny Co., St. Louis, Mo.
Harry Evansizer, De-Oxo-Lin Chemical Co., Kansas City, Mo.
E. A. Milberger, Kansas City, Mo.
M. J. Milberger, Kansas City, Mo.
Jack Slater, Pied Piper Exterminating Co., St. Louis, Mo.
L. L. Wicker, National Exterminating Co., Kansas City, Mo.
Alice Courson, Antimite Co., St. Louis, Mo.
L. S. DeAtley, Thompson Hayward Chemical Co., Kansas City, Mo.
Dr. L. Haseman, University of Missouri, Columbia. Mo.
Revnold Shuyler, Termite Exterminating Co., Kansas City, Mo.
J. H. Russell, Mexico Chemical Products, Mexico. Mo.
Jac Shafer, Shafer Pest Control Service, St. Louis, Mo.
Charles Maly. Maly Brothers Termite Control, St. Louis, Mo.
W. A. Barber, Sam C. Dew Co., Kansas City, Mo.
Henry I. Sherman, Charles Denny Co., St. Louis, Mo.
U. C. Hawks, Interstate Exterminator Co., Kansas City, Mo.
F. R. Andrews, Andrews Exterminating Co., Kansas City. Mo.
V. A. Bryan, W. B. McCloud & Co., St. Louis. Mo.
A. J. Danella, Acme Exterminators, Kansas City, Mo.
G. C. Clen, Rose Exterminator Co., St. Louis, Mo.
W. F. Exner, Termite Control Co., Webster Grove. Mo.
H. J. Hall, Advanced Exterminator, Springfield, Mo.
F. W. Hoffman, Advanced Exterminator, St. Louis, Mo.
John Karleskint, American Exterminator, St. Louis. Mo.
A. L. Linck, Paramount Fumigating Co., Kansas City, Mo.
J. C. Logan, Termite Control Service, Cape Girardeau, Mo.
Roy McCullough, Modern Fumigating Co., St. Louis, Mo.
J. O. Millspaugh, Millspaugh, Chemical Co., St. Louis, Mo.
A. Ochs, Antimite Termite Proofing Co., St. Louis, Mo.

Omaha Pest Control Association

A regular dinner meeting of the Omaha Pest Control Association was held on November 21. 1946 at the Athletic Club, with Mr. Joe Hahne, temporary chairman, presiding. Minutes of the last meeting were read and approved. Those present were: Fuller, Hahne. Levenson, Linn, Miller, Mills, Skarkev. and Trout.

Mr. Floyd T. Fuller of the Fuller Extermination Service was present for the first time. Motion made and carried that he be accepted as member of the Association.

Mr. Ward Combs and Mr. Marvin Welenz not being present. no report was available concerning Allied Members to be contacted.

Mr. Abe Miller then read a draft of the Constitution, and members were asked to fill in with suggestions.

Mr. Miller then suggested that a formal notice be sent each member notifying them of the January meeting. This is to be the annual meeting date of the Association.

Motion made by Mr. Linn and seconded by Mr. Mills that Mrs. Ethel Levenson be elected Secretary to serve until annual meeting in 1948. Motion carried.

Motion made by Mrs. Ethel Levenson and seconded by Mr. Trout that dues be $10.00 per year. Motion carried with one exception —Mr. Linn. Motion made and carried to authorize the printing of stationery and envelopes. Mr. Hahne suggested that we hold a State Meeting in Lincoln some time in April, Mr. Usher to be asked to make arrangements.

Mrs. Levenson suggested that minutes of all meetings be mailed to each member each month. Mr. Linn suggested that these minutes also be sent to National Office and Bill Buettner, Secretary.

All members were asked to help compile a complete list of Exterminating Companies operating in the State. This list to be used for calling the State Meeting.

There being no further business the meeting was adjourned at 10:30 P.M.

Respectfully submitted,
Mrs. M. F. Levenson, Secy.

Silverfish

By E. A. Back, principal entomologist, Division of Insects Affecting Man and Animals, Bureau of Entomology and Plant Quarantine. Leaflet No. 149. Issued October 1937; Revised June 1946. For sale by the Supt. of Documents, U. S. Government Printing Office, Washington, D. C. Price 5c (in coin).

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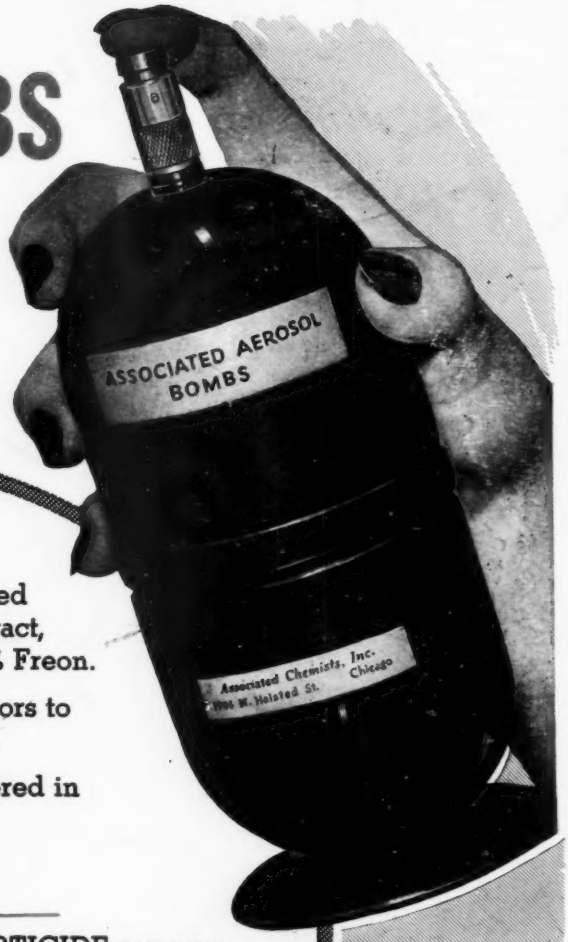

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